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ABSTRACT

The inservice teacher training packet, developed with help from the environmental education program of the Upper Mississippi River ECO-Center, is designed to help intermediate-level teachers develop teaching skills which will enable them to introduce environmental or outdoor education to their students and develop those concepts, attitudes, and behavioral skills which lead to environmental responsibility. Reflecting the need for environmentalization on many instructional levels, the flexible one or two day program includes sections which focus on environmental awareness, classroom activities, school site activities, field trips, and community resources. The many activities in these sections can be adapted for class use with little or no change, and the activity descriptions usually include objectives, instructional levels, and materials lists. The interdisciplinary approach involves group and individual activities such as role playing, values clarification, games, home and school environmental surveys, career visits, art projects, science projects, and environmental observation. The packet also includes a sample inservice program schedule, a section on developing an environmental education program, references, equipment lists, field trip materials, resources, and an awareness test. (SB)

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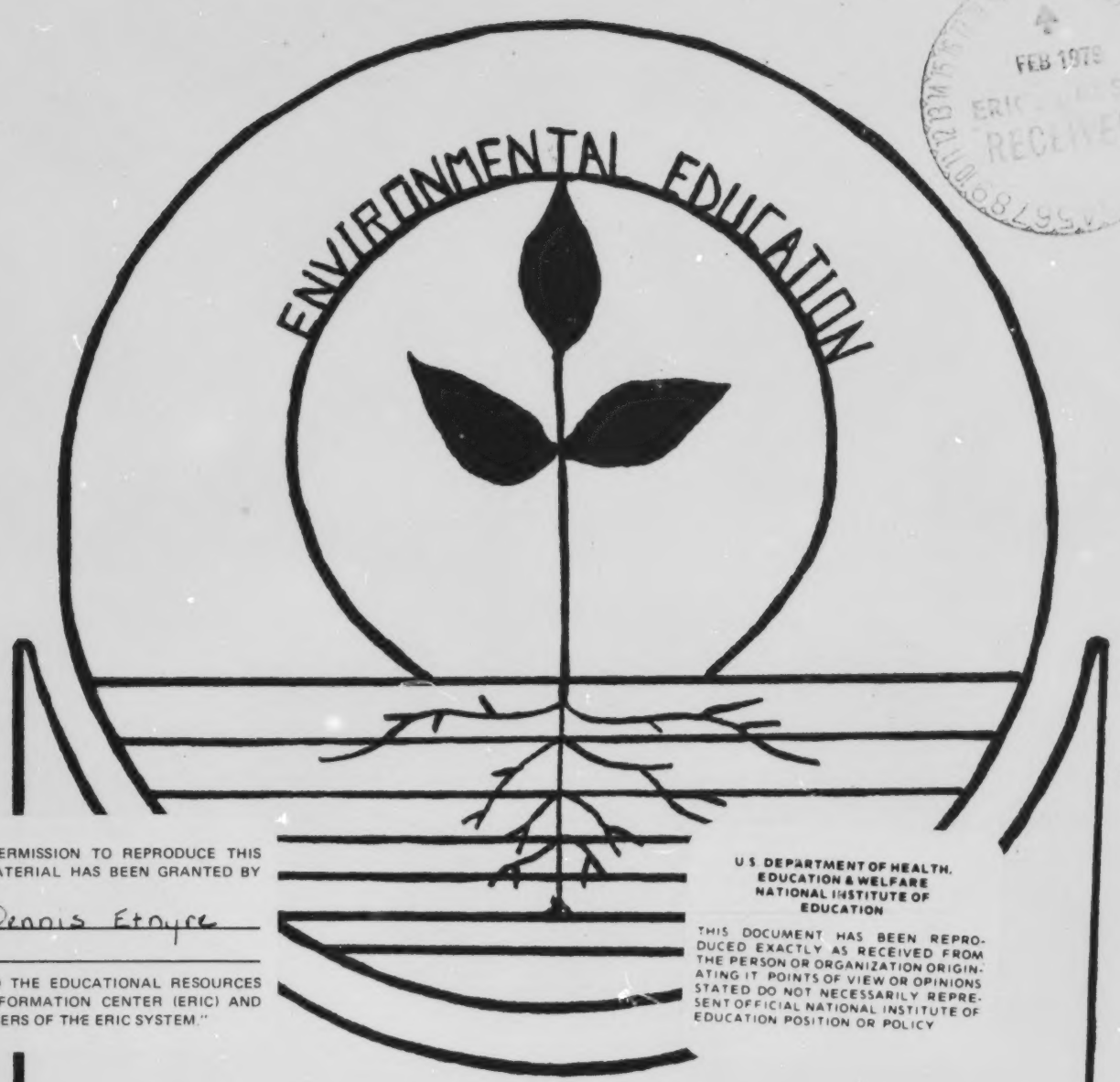

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AN INSERVICE TRAINING MANUAL

Developed By:

THE UPPER MISSISSIPPI RIVER ECO-CENTER
DIFFUSION MODEL TITLE IV ESEA

Administered By:

CARROLL COUNTY EDUCATIONAL SERVICE REGION

{1975}

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ENVIRONMENTAL EDUCATION

INSERVICE TRAINING PACKET

FOR THE INTERMEDIATE LEVEL

Developed by:

UPPER MISSISSIPPI RIVER ECO-CENTER

DIFFUSER MODEL TITLE IV ESEA

Administered by:

Howard L. Kennedy, Superintendent
Carroll County Educational Service
Region

Preface

You are about to lead a group of fellow teachers on a unique trip into the world of environmental education. This inservice could be unlike any other inservice in which you have taken part. You as the leader are the key to making it such a program.

The first thing I want to say to you is relax, be loose. This is an activity-orientated program, one in which all participants should become involved. Everyone must become involved if they expect to gain anything from the program. Encourage everyone to be relaxed and enjoy themselves.

Secondly, take some time to become familiar with each section and each activity. In this manual there is an explanation and guide for each activity. It will tell you how to set it up, how long it should or could take, and what results to expect. Some activities do touch on controversial topics and may result in heated discussion. This is good, but must be watched and controlled.

Finally, this program can be completed in one day or in two days depending on your set-up. Do not rush the experience; you will know when things start to drag and need a change. Use your own judgement; the program is flexible and will adapt to many situations.

I hope this adventure will bring excitement and understanding about environmental education to all who take part. It can be a wonderful adventure and one that could bring new life into each and everyone's teaching.

I hope you enjoy the program.

Bruce Floyd
Developer

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Sample Inservice Program

One Day Inservice Schedule (9:00-3:00)

9:00	Introduction - Background
9:15-10:00	Decision by Consensus
10:00-10:45	Census of Behaviors
10:45-11:00	Coffee - Cookie Concern
11:00-12:00	Environmentalizing Your Classroom Teaching
12:00-1:00	Lunch
1:00-2:00	School Site as a Learning Resource
2:00-3:00	Developing Your Own Program

1. Have coffee available (cookies are part of one activity)
2. A room which has access to the out-of-doors and away from other activities so as not to disturb them.
3. Have people dress for going out-of-doors.

Two Day Inservice Schedule

Day 1 (9:00-3:00)

9:00	Introduction - Background information
9:15-10:00	Decision by Consensus
10:00-10:45	Census of Behaviors
10:45-11:15	Coffee - Cookie Concern
11:15-12:00	Role Playing Activity (if numbers permit) or a discussion of environmental problems in your community.
12:00-1:00	Lunch
1:00-2:30	Olympics or Community Resources & Classroom Activities
2:30-3:00	Rap: evaluate day and future of program. Does environmental education have a place in your school?

Day 2 (9:00-3:00)

9:00	Introduction - Background information
9:15-10:15	Classroom work - Environmentalizing Your Classroom Teaching
10:15-10:30	Coffee
10:30-12:00	The School Site as a Learning Resource
12:00-1:00	Lunch
1:00-3:00	Developing Your Own Program

Acknowledgements

I would like to thank the staff and friends of the Upper Mississippi River ECO-Center for their cooperation in developing this inservice packet. Many of the activities found in this collection were developed by the ECO-Center for use in its environmental education program. A program which was originated under Title III ESEA and is now a cooperative endeavor between eleven school districts of Northwestern Illinois. Also, I would like to thank Dr. William B. Stapp and Dorothy A. Cox for permission to use activities from their ENVIRONMENTAL EDUCATION ACTIVITIES MANUAL, their cooperation is appreciated. A big thanks to the students, teachers, and citizens of Carroll County for their cooperation and support of the ECO-Center programs.

This section of the inservice handbook gives the teachers some background information on environmental education, its philosophy, objectives, and goals. Look it over, acquaint yourself with the general feeling of the section. A general understanding of environmental education will make it easier for you to lead this inservice.

The unit on concepts, attitudes, and skills should be the heart of your school's environmental program. The fundamental concepts should be kept in mind and be a part of any activity you plan, be it working in a classroom, using the school site, or conducting a field trip. They should become goals of individual units and each child must have a basic understanding of the concepts, if he or she is to be a citizen who has a feeling for our environment.

It is important that your fellow teachers look the introduction section over carefully. You may want to take some time at the beginning of the program to go over this part with the teachers or just outline it for them and spend some time on it later.

Introduction To Inservice Training

Environmental Education or Outdoor Education is by no means a new idea. Thoughts and aspirations of using the out-of-doors have been in the minds of teachers for years. As early as the 1930's men had visions of education using the out-of-doors. L. B. Sharp, early founder and designer of outdoor education through school camping, probably stated the philosophy of outdoor education best: "That which can best be learned inside the classroom should be learned there. That which can best be learned in the out-of-doors through direct experience, dealing with native materials and life situations, should be learned there."[1]

"Outdoor education means learning in and for the outdoors. It is a means of curriculum extension and enrichment through outdoor experiences. It is not a separate discipline....; it is simply a learning climate offering opportunities for direct laboratory experiences in identifying and resolving real life problems, for acquiring skills with which to enjoy a lifetime of creative living, for building concepts and developing concern about man and his natural environment, and for getting us back in touch with those aspects of living where our roots were once firm and deep."[2]

This inservice packet and the entire series are designed with the idea to manifest within the participants the desire to develop teaching skills which will enable them to introduce environmental or outdoor education to their classroom and to develop those concerns about man and his environmental problems which so plague us today. The sessions are set up as active learning experiences, ones in which the participant becomes involved. It has been proven that after taking part in these training sessions fears and inhibitions about leaving the security of the classroom soon disappear.

All we ask is that you come with an open mind. We hope you leave with a feeling of enrichment and confidence. Environmental education is not new---it's been out there all your life.

[1]L. B. Sharp, "Introduction," Outdoor Education for American Youth, (Washington, D. C.: AAHPER, 1957).

[2]Julian W. Smith, Reynold E. Carlson, Hugh B. Masters, George W. Donaldson; "Outdoor Education," second edition, (New Jersey: Prentice-Hall, Inc., 1972).

What Is Environmental Education?

Philosophy

"We live in a closed life-support system. We have on our spaceship earth, all the air, water and land we will ever have. Space and resources are limited and we are confronted with unprecedented environmental problems. Man has but a short time to become trustee of his inherited land, air, and water, and to live in harmony with his environment", (Stapp 1972). How well and how soon the children of today learn this lesson rests the fate of our existence on planet earth. The need for environmental education is eminent.

Environmental Education has been developed with the underlying philosophy that:

Environmental Education Should Have A Clear Statement Of Objectives.

Unless goals are set, environmental education would become a series of unrelated experiences.

Environmental Education Is Needed At All Levels Of The Educational Spectrum.

Education is a continuous process. The fifth grade program represents only one important part of the overall picture.

Environmental Education Is Interdisciplinary.

Environmental Education should not be a separate subject but should be part of the existing curriculum.

Environmental Education Should Be Approached From All Facets.

There isn't a single method or approach to environmental education; all aspects of the learning process need to be used. Children do not learn alike.

Environmental Education Includes Outdoor Education.

The real world exists outside the classroom. Environmental study areas need to be established.

.....

The ultimate goal of environmental education is that of developing citizens that have concerns and assume responsibility for a quality environment. Such citizens would be knowledgeable about man and his relationship to his environment, concerned about proper management of environmental problems, and willing to act to solve such problems. To reach this goal one must environmentalize their teaching, this environmentalization should take part on five levels. We will discuss each point in greater detail later.

1. Classroom instruction
2. School site use
3. Community learning resources
4. Field experience
5. Cooperation with agencies and organizations

INTRODUCTION

Today it is becoming increasingly evident that education needs to concern itself with the environment. An awareness of the environment and man's relationship to it must be developed if each student is to function as a responsible citizen who will do his share in shaping a better world in which man may live and mankind survive.

True learning can be achieved only by using all facets of the educational process. This is exceedingly true of environmental education. The classroom is an important but limited part of the educational environment. Lessons, discussions, readings, audio-visual presentations, and local resource persons are all important. The school site and community make excellent environmental study areas. What better way to study the real environment? Here a teacher can better communicate to the sudents the interdependence and relationships that exist in nature. In order for the school site to be used as an environmental study area, learning activities must be established. Lessons should have clear objectives and allow for student involvement. Field trips to natural and man-made environments are also important parts of environmental education. Field experiences bring the student in contact with the real world as it exists and provide the student with first hand studies of interrelationships between man and nature.

OBJECTIVES

In order for education to produce desired terminal behaviors, objectives must be clearly stated, learning activities developed and coordinated, and evaluation of progress determined at each step of the educational process.

TEACHER OBJECTIVES

In integrating environmental education with the existing curriculum a clear set of objectives must be developed. The major objectives of fifth grade teachers in implementing environmental education are:

I. Cognitive - To assist the pupils in recognizing and understanding the basic environmental concepts that affect life on earth, including use and conservation of resources.

II. Affective - To assist the pupil in developing an appreciation and concern for his environment.

III. Behavioral Skills - To assist the pupil in developing skills necessary for the preservation of the environment.

CONCEPTS, ATTITUDES, AND SKILLS

For any environmental program to meet the above objectives specific concepts, attitudes, and skills need to be identified. The first fifteen concepts are the basis for any program which effectively deals with the philosophy of environmental education. These concepts should be the heart of any program that you may write.

I. COGNITIVE

A. The students should know basic fundamental concepts of the earth's environment.

1. The environment is every thing around any organism, all living and non-living things.

2. Life is interdependent. All living organisms are dependent upon other living organisms.

3. All energy comes from the sun.

4. Green plants use the sun's energy, water, minerals, and air to make food which is the source of energy for all living things.

5. All life is dependent upon earth's resources.

6. The earth is like a spaceship and has only a limited amount of air, water, and soil to support life.

7. Nature does not stay the same but gradually changes (evolves) over a period of time.

8. Natural resources are not equally distributed over the earth. This affects conditions and quality of life.

9. Renewable resources are those that can be produced again; non-renewable resources are limited and can not be produced again.

10. Man is using resources today faster than ever before.

11. Man has the ability to manage and change his environment for good or bad.

12. Man has the ability to damage the ecosystem permanently by misusing earth's resources.

13. For man to survive he must use resources intelligently without permanently interrupting nature's cycle.

14. Wildlife is a necessary part of life and must be managed intelligently.

15. Conservation is the careful preservation and protection of natural resources to insure an adequate supply for the present and the future.

B. Students will be able to enlarge on the preceding fifteen basic concepts.

1. All living organisms and non-living things in an area interact or affect each other. (The "ECO-System")

2. Since each organism depends on some other for food, any interruption in the ecological cycle causes hardship for some other organism in the cycle.

3. Energy is passed on by means of food chains from producer to consumer.

4. Green plants are the only organisms that can use the sun's energy to produce food, so all organisms are dependent on green plants.

5. Natural resources include air, water, soil, and a suitable habitat to live in.

6. Since natural resources are limited, man must make wise use of these resources.

7. The constant orderly change in nature is known as succession.

8. Since natural resources are not evenly distributed over the earth's surface, the quality of life varies from place to place. Man must learn to use available resources wisely. This inequality affects life and results in differences from place to place on the earth.

9. Some resources are renewable. Examples are forests and soil. Other resources are not renewable and once used cannot be replaced. Examples are oil and iron ore.

10. Modern man makes great demands on natural resources. It is only through intelligent conservation that there will be supplies of some resources for the future.

11. Man always changes his environment. It is only through careful management that this change is for good. It is often bad. Multiple use is a good example of careful management.

12. Man may damage his environment permanently. Examples are pollution, erosion, destruction, and waste.

13. Conservation and careful management of natural resources will insure an adequate supply for future use. It will also insure a healthful environment for the present.

14. Wildlife is considered a natural resource and is part of the ecosystem. Careful management will provide for human use and prevent species from becoming extinct.

15. The careful use and management of natural resources is called conservation.

II. AFFECTIVE - To assist the pupil in developing an appreciation and concern for his environment.

A. Man must enjoy, appreciate, and respect his environment.

B. If man is to live in harmony with his fragile environment, he must look at his own buying and behavior patterns as well as governmental, commercial and industrial policies.

C. Man must develop an ecological conscience toward the environment which reflects a commitment of individual and group responsibility to future generations.

III. BEHAVIORAL SKILLS - To assist the pupil in developing skills necessary for the preservation of the environment.

A. Students will learn problem solving.

B. Students will become informed about the problems.

C. Students will develop solutions and implement a plan of action.

Through the use of the cognitive, affective, and behavioral skills you will have a program that makes students aware of, have knowledge of, and develop skills to solve the problems of our environment. These are the keys to a citizenry which has environmental literacy.

TEACHER ACTIVITIES

To meet objectives for environmental education all or part of the following activities should be implemented by teachers:

I. Develop an interdisciplinary approach to environmental education stressing the inter-relationships between man and nature.

II. Develop and use areas outside the classroom.

III. Develop and conduct one day field experience at local outdoor sites.

IV. Develop local curriculum materials based on behavioral objectives.

V. Identify and use appropriate resource materials.

VI. Provide students with enjoyable and personally satisfying experiences in the outdoors.

In order to meet these activities the following inservice program has been developed to help you begin to think and to teach environmentally.

Teacher Evaluation

Evaluation should be a continuous process. To check progress made in implementing environmental education teachers may use the following self-evaluation checklist. Remember individual teachers will approach environmental eduation from individual strengths.

Self Evaluation Checklist for Implementing Environmental Education

EE means Environmental Education

_____ 1. Have objectives and concepts been clearly stated?

_____ 2. Have objectives and concepts been coordinated with other grade levels?

_____ 3. Have objectives and concepts been coordinated between discipline areas?

_____ 4. Has the teacher been involved in a minimum of a one half day inservice training session devoted to EE?

_____ 5. Has an average of 40 minutes per week or equalivalent been devoted to EE in the classroom?

_____ 6. Has EE been incorporated appropriately into all subject areas?

_____ 7. Has the class been on an equivalent of two all day ecology-oriented field trips?

_____ 8. Have at least five appropriate films and filmstrips dealing with EE been identified and used?

_____ 9. Has a classroom EE reference area been set up for student use?

_____ 10. Has an EE curriculum guide been developed?

_____ 11. Have at least two qualified resource personnel visited the class?

_____ 12. Has the school site been utilized for at least five study activities?

_____ 13. Have activities focused on world, national, state, and local environmental problems?

_____ 14. Have activities been participant-centered, actively involving the individuals?

_____ 15. Has student progress in EE been evaluated?

LET US BEGIN TO THINK ENVIRONMENTALLY

This section contains seven activities. Each one created to force participants to start to think critically about the environment and their role in it.

Each activity has a leader's guide giving you a little background, what to expect, how to set it up, and follow-up ideas. The activities require that each participant become involved. Be sure you approach it that way. It is not important that you complete all seven activities; in fact, there will not be time if you follow the sample program.

As in the classroom, take some time to get to know your material before embarking on this inservice program. Feel free to change any activity to fit your own particular situation. Only you know the people who are taking part in your program; change and rearrange the material so it works for you.

LET US BEGIN TO THINK

ENVIRONMENTALLY

The activities included in this section are designed to help you start to think environmentally. They should be considered food for thought. Some of them could be revised and used in the classroom.

The inservice leader will set each activity up and help you evaluate the findings of each activity. So let us begin to think environmentally.

A Model For Environmental Education

Census of Behaviors

The following sheet is a value clarification exercise you might want to try on yourself, a fellow teacher, or your students.

In view of environmental concerns today, a model is presented for the overall goal of environmental education. The goal is stated in terms which should be acceptable to most citizens. A rating of these behaviors may help to identify citizens that exhibit the overall goal.

GOAL - To develop a citizenry which is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution.

Instructions to the leader:

I. Rating Behaviors

In this activity the participants are to rank each of the vertical columns (A-D) according to their feelings in relation to statements listed. The ranking will be on a scale of 1 to 5.

1 - Strongly disagree
2 - Disagree
3 - Maybe yes, maybe no
4 - Agree
5 - Strongly agree

For each column there is a general statement which will proceed each numbered statement. (Statements listed below) So for column A each numbered statement 1-10 will be proceeded by "Sixty-five percent of the people in your community have this behavior". You will read the column statement then the numbered statement. The participants then must rank their feeling to each particular statement.

For example: Column A, Statement number 1.

Sixty-five percent of the people in your community are able to discuss environmental issues intelligently. If you strongly agree with this statement put a 5 in the box next to number 1 column A. If you strongly disagree with the statement put a 1 in the box next to number 1 column A. Continue this procedure for all numbered statements going down column A.

Go on to column B. Read column B statement, then the numbered statement. "It's important that people who are able to discuss environmental issues intelligently be supported." Again if you strongly disagree with the statement put a 1 in the box next to number 1 column B. If you strongly agree put a 5 in the box next to number 1 column B. Continue in the same manner for all numbered statements in column B. Then go on to columns C and D.

Column A - Sixty-five percent of the people in your community have this behavior.
Column B - It is important that people who have these behaviors be supported.
Column C - It would be desirable for students in your school to exhibit these behaviors.
Column D - Think about yourself. (Not ideal self, but what you are now.) To what extent do you have these behaviors?

Interpreting the Data

Now that the statements have been ranked, tabulate vertically and horizontally. The horizontal ranking might indicate what behaviors seem to be important, hard to attain, or perhaps controversial. The vertical ranking might reveal some interesting comparisons. For instance, do you expect more from others than you yourself exhibit? A further interpretation of the data might include determining means and spreads for an entire class. Or perhaps having a class do a survey. Each behavior could be graphed according to what percent rank 1 & 2, what percent 3, what percent 4 & 5.

II. Name three persons living or dead who exhibit most of these behaviors. Again a tabulation might be done. The answers should be used to find out participants' basic knowledge of people and organizations who are leaders in the environmental field. Have each one tell why they listed whom they did.

III. What Direction?

After examining the results, some of the questions before you now are: What are the patterns of response? What are the implications, if any? What if anything should be done about it? What would be the next steps? What is needed to move in the desired direction?

Census of Behaviors

Instructions:

The program leader will read to you the instructions for each section of this activity. Always work down the columns not across.

		A	B	C	D
I.	1. Being able to discuss environmental issues intelligently				
	2. Being able to gather information about environmental issues				
	3. Being able to make sound judgements about environmental issues				
	4. Being able to influence environmental decisions making at the local, state, and national levels				
	5. Being actively involved in an environmental organization to protect the environment from misuse				
	6. Feeling free to criticize governmental decisions which threaten the environment				
	7. Feeling free to protest governmental decisions which threaten the environment				
	8. Feeling able to take part in a recycling campaign in the local community				
	9. Advocating that citizens should limit family size to cut down on the use of resources				
	10. Feeling able to influence lawmakers and industrial leaders in the U.S. on environmental concerns				
II.	_____	_____	_____		
III.	_____	_____	_____		

1 - Strongly disagree
2 - Disagree
3 - Maybe yes, maybe no
4 - Agree
5 - Strongly agree

Developed by Dr. Weiner (NIU)

DECISION BY CONSENSUS

This activity is designed to be used as an ice breaker. It should be used early in the training session and introduced as an exercise in decision making. The activity helps loosen people up so that meaningful dialogue can take place, not only during the activity but also throughout the entire training session.

After all groups have come to a decision or time has run out, discuss the rankings made by each group, the difficulties that arose during their group meetings and how the whole activity applies to today. Where and how do we as teachers and citizens start to solve our environmental problems?

TIME: 30 to 40 minutes

DECISION BY CONSENSUS

INSTRUCTIONS: This is an exercise in group decision making. Your group is to employ the method of Group Consensus in reaching its decision. This means that the prediction for each of the 15 survival items must be agreed upon by each group member before it becomes a part of the group decision. Consensus is difficult to reach. Therefore, not every ranking will meet with everyone's approval. Try, as a group, to make each ranking one with which all group members can at least partially agree. Here are some guides to use in reaching consensus:

1. Avoid arguing for your own individual judgments. Approach the task on the basis of logic.
2. Avoid changing your mind only in order to reach agreement and avoid conflict. Support only solutions with which you are able to agree somewhat, at least.
3. Avoid "conflict-reducing" techniques such as majority vote, averaging or trading in reaching decisions.
4. View differences of opinion as helpful rather than as a hindrance in decision-making.

On the "Group Summary Sheet" place the individual rankings made earlier by each group member. Take as much time as you need in reaching your group decision.

About the year 2000 a spaceship landed on the densely populated earth. Because of a mechanical failure the passengers were unable to leave or to get help from their own planet. As they had to stay, they examined the situation. The environment would sustain life but was so badly polluted that the castaways could not survive unless radical changes were made at once.

Below is a list of things they must do to make the planet livable for themselves. Rearrange the list in order of importance.

Your Ranking	Group Ranking		
_____	_____	1.	Control population growth.
_____	_____	2.	Purify water.
_____	_____	3.	Gain control of governments.
_____	_____	4.	Inform inhabitants of problems.
_____	_____	5.	Dispose of solid waste.
_____	_____	6.	Control emission.
_____	_____	7.	Develop universal recreational facilities.
_____	_____	8.	Solve the energy problem.
_____	_____	9.	Control vandalism.
_____	_____	10.	Control all aspects of transportation.
_____	_____	11.	Control food processing.
_____	_____	12.	Control noise.
_____	_____	13.	Set financial priorities.
_____	_____	14.	Implement program of aesthetics.
_____	_____	15.	Control depletion of natural resources.

THE OLYMPICS OF OUTDOOR EDUCATION

This activity is just what it says it is - an Olympics. It is run just like the Olympic games. You will need to divide the group into teams, have number cards made and an area arranged for the games. The instructions for the games are listed on the activity sheet. You will have to evaluate the situation to determine how tight or open you will have this activity. If the number of participants is the problem, cut down on the number of events, teams, etc.

This is very much an interdisciplinary activity. It covers all subject areas and materials. It can be very exciting and great fun.

Materials Needed:

1. Blackboard
2. Judges' number cards (5 sets of cards numbered 1-10)
3. Team name cards for use at judges' table
4. Awards (if used, make your own from things you have on hand)

Follow up: Spend some time discussing how this activity could be integrated into the classroom.

The Olympics of Outdoor Education

The Olympics will be held with three teams competing: U.S.A., U.S.S.R., and Kenya.

1. Each team is to go outside, find a natural object which can be used without environmental damage, and bring it inside.

2. Each team is responsible for one member competing in the following events pertaining to the natural object:

1.	Uses of it	1.2 d/d	(degree of difficulty)
2.	Explain its ecological niche	1.7 d/d	
3.	Write a short story about it	2.0 d/d	
4.	Write a poem about it	2.5 d/d	
5.	Write a song about it	3.0 d/d	

3. Each team is responsible for providing a judge, other than the competitor for each event.

4. Teams have 45 minutes to prepare for competition.

Judging

Each event will be judged by five experts representing the following countries: U.S.S.R., U.S.A., England, Kenya, and Poland

The judges will score each participant on a scale of 1 - 10 with the high and low score being thrown out, and the remaining scores multiplied by the degree of difficulty. Individuals will be judged on the following categories:

1. Originality
2. Method of presentation
3. Content

Team scoring will be obtained by adding all the individual team member's scores.

Awards

Medals will be presented to the first, second, and third-place individual in each category.

Awards will be given to the first, second, and third place team.

Activity

This activity could be adapted to many classroom situations, especially rained-out field trips, days before vacation, or review days. The activity touches the following areas: outdoor education, creativity, math, language arts, ecology, aesthetics, speech, sociology, international relations, and sports.

Olympics of Outdoor Education
Score Card

Team: U.S.S.R.

Event	Individual	Scores	d/d	Total
1. Use			x 1.2	
2. Niche			x 1.7	
3. Short Story			x 2.0	
4. Poem			x 2.5	
5. Song			x 3.0	
			Team Total	

Team: U.S.A.

Event	Individual	Scores	d/d	Total
1. Use			x 1.2	
2. Niche			x 1.7	
3. Short Story			x 2.0	
4. Poem			x 2.5	
5. Song			x 3.0	
			Team Total	

Team: Kenya

Event	Individual	Scores	d/d	Total
1. Use			x 1.2	
2. Niche			x 1.7	
3. Short Story			x 2.0	
4. Poem			x 2.5	
5. Song			x 3.0	
			Team Totals	

COOKIE CONCERN

This activity is one which is best run during the coffee break. Just before the break, split the group as described in procedure. (see below) When they come back with their cup of coffee give the groups their plates of cookies. Sit back and watch what happens.

Cookie Concerns

1. Concept to be developed: Ecosystem

2. Understanding to be developed: Humans and natural resources are distributed unevenly around the earth.

3. Time involved: 30 minutes.

4. Materials: Bag of cookies with enough for everyone in the classroom
   Tape recorder and tape

5. Procedure:

   a. Dump the cookies out into two equal piles on separate trays. Start the tape.

   b. Give one tray to two people in the class and tell them they may have all they want of the pile.

   c. Give the other tray to the rest of the class to share. There should not be enough to go around in this pile. Be sure to notice every detail of behavior that takes place here.

   d. Let things go for a while without comment or explanation. They are role playing without knowing it.

   e. Ask them to settle down and stop the recorder.

6. Discussion Questions:

   a. Do you know why this activity was done?

   b. If cookies represent all the natural resources and wealth in the world, who do you suppose the two people with half of the cookies represent?

   c. How did the rest of you feel? Do you suppose the poor in India, Brazil or Mexico feel the same way?

   d. How did the two Americans feel about their position in the class activity? Do you think your feelings are similar to the way the American public seems to feel about the lack of food, medicine and conveniences in other parts of the world?

   e. Play back the tape and stop to discuss interesting comments, trying to equate them to current world crisis.

*From Environmental Education Activities Manual by William B. Stapp and Dorothy A. Cox. Copyright 1974.

WHO SHOULD SURVIVE?

This can be a very touchy exercise. Approach it with care. As the instructions say, the group must decide who of the 15 are going to stay and who must go.

Use two or three groups. Let them come up with a decision, then bring the whole group together and have the smaller groups report. Discuss each group's report. The activity is designed as a critical thinking experience, one in which all aspects of the problem must be explored before a decision can be made.

Time: 40 to 50 minutes

Who Should Survive?

The following 15 persons are the only people left on the planet. The people have cared nothing for the environment, and this planet's ability to support life is almost non-existant. It will take two years for the environment to naturally clear up and again be able to support a minimum amount of life. The food on the planet can sustain, at a very minimum level, only seven persons for two years. Briefly, only seven persons can minimally survive. The group decision must not only be by consensus, but also must be unanimous.

1. Dr. Dane - 39, white, religion-Agnostic, Ph.D. in history, professor, good health, married, one child (Bobby), active in politics.
2. Mrs. Dane - 38, white, Jewish, AB & MA in psych., counselor for mental health facility, good health, married, one child (Bobby), active in community.
3. Bobby Dane - 10, white, Jewish, special ed. classes for 4 years, mentally retarded, I.Q. of 70, good health, enjoys pets.
4. Mrs. Garcia - 33, Spanish-American, Catholic, 9th grade education, cocktail waitress, prostitute, good health, married at 16, divorced at 18, raised in foster home, raped by foster father at 12, ran away and returned to reform--atory until age 16, one child, 3 wk. old (Jean).
5. Jean Garcia - 3 week old, Spanish-American, good health, nursing for food.
6. Mrs. Evans - 32, Protestant, Negro, AB & MA in elementary education, divorced, one child (Mary), good health, cited as outstanding teacher, enjoys working with children.
7. Mary Evans - 8, Negro, Protestant, honor student, 3rd grade, I.Q. of 150.
8. John Jacobs - WASP, honor student, 13, 8th gr., very active, broad interests, father is Baptist minister, good health.
9. Mr. Newton - 25, Negro, claims to be an aethesist, started last year of med. school, but suspended for alleged homosexual activities, good health, seems bitter concerning racial problems, wears fashionable clothes.
10. Mrs. Clark - 28, Negro, Protestant, college grad., engineering electronics, married, no children, good health, likes outdoor sports and music.
11. Sister Mary Kathleen - 27, nun, college grad. English major, good health, father is business man.
12. Mr. Blake --51, white, Mormon, BS grad., mechanic, "Mr. Fix-it", married, 4 children, (not with him), good health, enjoys outdoor sports, likes people.
13. Miss Harris - 21, Chicagoan, college senior, Protestant, nursing major, good health, enjoys outdoor sports, likes people.
14. Father Franz - 37, white, Catholic, college plus seminary, priest, active in civil rights, critized for liberal views, good health, former college athelete.
15. Dr. Gonzales - 66, Spanish-American, Catholic, medical doctor-general practitioner, has had 2 heart attacks in the past 5 years but continues to practice.

Your Community's Environment

This exercise asks the group to look right in their own community for environmental problems and to investigate those problems. Also it asks the teachers to identify what part children should play in the identification and solutions of environmental problems in their community. If you are unable to use the environmental confrontation you should go through this activity. You may wish to do this in addition to the confrontation if time permits.

Environmental Confrontation

The following environmental confrontation can be used to discuss today's environmental problems while studying community relationships. The activity will be a simulated public hearing. A minimum of 7 people are necessary to run this activity.

A small community has just started to grow after many years of depression. It has been the best of the last ten years for the community's businessmen. Much of this growth is due to the addition of a large industry to the community. There is one other small industry already in town. The larger industry employs a great number of residents from the community as well as a large number from the neighboring town.

But everything is not all roses in Garden City. The new industry is dumping its chemical waste into the river which runs through town. The river is the source of drinking water for the neighboring community, Thornville. The factory's waste pollutes the river to the point where the water purification system of the neighboring city can not handle the additonal burden. It is not feasible for Thornville to invest 10's of thousands of dollars to up-grade their purification system, and it would cost the industry in Garden City close to a million dollars to build a treatment facility to treat its waste. The industry can't afford to build a waste treatment plant without cutting back on its labor force or cutting services. What should be done?

A public hearing has been called by the County Board to try to solve the problem that exists between the industry in Garden City, the neighboring cities, and sporting groups which are upset by the damage done to the river. The pollution has prevented further sport fishing, hunting, and other water recreation.

<u>Roles to be played</u>

1. A chairman and 2 people from County Board
2. 2 representatives of the industry
3. 2 representatives from Garden City Chamber of Commerce
4. 2 representatives from Committee for a Clean River
5. 2 representatives from Thornville City Board
6. 2 representatives from the press

Each group has its own motives which it wants known at this hearing: the industry doesn't feel that it is polluting; the Garden City Chamber wants the industry to keep at full production so it can continue to have profitable years; Thornville City Board wants the industry to stop polluting so it can save its purification system; the committee for a clean river wants the industry to clean up the river so that it is safe for all types of water recreation; a member of the county board wants the industry to move to his town and bring the growth to his community; and the press is the group that exposed the pollution from the plant in the first place.

Procedure:

1. Divide the group into the required roles. Set yourself up as chairman of County Board.
2. Decide if you want to give each group the motives they have or not; it is your choice.
3. Spend 15 to 20 minutes to prepare; 20 to 30 minutes for the meeting.
4. Spend some time following the experience discussing the role-playing activity. Discussion could center around the problem, the solutions, the rational of the presentation by each group, the mood of the meeting, the environmental impact of the factory, and the total relationship of the communities involved.

Your Community's Environment

1. Does your community have any environmental problems? What are they? (list) If you answered # 1, No, tell why your community does not have any problems.

2. What is the history behind the problems in your community?

3. Are there reasonable solutions to the problems?

4. What in your mind, should be done, about the problems in your community?

5. Should your children be made aware of the problems? If you answered # 5, No, state your reasons why.

6. List possible ways in which your children may be made aware of the problems.

7. Should your children develop solutions to the problems?

8. What type of solutions would your children come up with?

9. What is your community doing to solve the problems?

10. What can the children in your class do to help the community solve the problems?

Classroom Activities

Starting to teach environmentally can easily begin in the classroom and that is why we present this section. Many teachers find it very difficult to change. With that in mind we introduce environmental education into an area that most teachers feel most comfortable - their classroom.

Your part of the program will be to choose a number of activities to be completed by the participants. These are activities which the teachers can use with their youngsters and no revision will be needed. So, pick a number of activities covering many discipline areas and go through them with your fellow teachers. As in teaching in the classroom, it will be necessary to have all materials ready before hand so it can be a worthwhile experience.

Implementing Environmental Education In Your Classroom

When first starting to teach a different subject or new program, everyone is a little uneasy. The best place, then, to introduce environmental education is in an environment which is familiar to you--the classroom. This is an area in which the majority of teachers feel comfortable, because they have control over most things that happen there. Unlike in the out-of-doors, the teacher is in complete control. Therefore, the teacher is on home ground and comfortable with the situation. Also, he or she is responsible for the atmosphere which exists in the classroom. When teaching was viewed in terms of teacher-directed activities the job of the teacher was comparatively easy. Today, child-initiated activities are viewed as having great importance, and the necessity for the child to learn by first-hand experience has put pressure on our educational structure. The interdisciplinary approach of environmental education can relieve some of that pressure. By introducing environmental education theories and philosophies into many different curriculum areas, the first-hand experience desired can come easily.

An example of this could be the study of stripmining and its related activities. The study may first originate in a geography lesson, but easily be expanded to encompass many subjects. The question may arise "is it possible to reclaim some lands that have been stripmined?" To keep the learning process intune with the student-directed activities, have the students invistigate the possible answers. One group may write the Department of Interior to see how stripmined lands are reclaimed. A relevant English lesson could be derived from this activity. Another group could interview local mining companies or local engineers for more information. Others could find out how other countries solve the problem. A question which could have been easily answered by the teacher now becomes a first-hand learning experience for the students.

Other activities may mean bringing in outside resources to the classroom to answer questions or present programs which are relevant to the on-going activities of the classroom. It is not a

Page 30 deleted, material duplicated on top of page 31.

difficult task to environmentalize your teaching. Just take advantage of opportunities that arise in daily activities to develop a child who is knowledgeable about man and his relationship to his environment, concerned about proper management, and willing to act to solve problems.

Included in this section are some examples of classroom activities. They cover many subject areas and grade levels. For more activities see the list of curriculum materials available from the ECO-Center included in the appendix.

List of Activities

ECO-Chatter
School Environmental Science Survey
Energy
How Soil is Made
Holiday Senses in Sentences
Poetry Fragrance
Pollution
Wildlife Management
The Water Cycle
Assorted Classroom Activities Dealing with Air, Plants, and Water Management
Environmental Career Education Interview

ECO-CHATTER

This game is designed to be coordinated into the language arts program for use in spelling and word meaning.

OBJECT OF THE GAME: To enhance the student's knowledge and understanding of environmental vocabulary words.

HOW TO PLAY: Choose 6 teams of 4 players or any other combination. Give each team a packet of blank cards, 3 x 5 index cards can be used. The teacher shall call out a word from the list of environmental vocabulary words and each team has one minute to write the correct spelling down on their card. When time is up each team shall hold up its card and the teacher or checker shall see if the word is spelled correctly. If they have spelled the word correctly, that team is awarded points. (See enclosed point list.) The students are next asked to write the definition on the back of the card, one minute or more for this step. After the time limit is up, the teams should show their cards to be checked by the teacher or checker. If they have the correct definition they are again awarded points. (See enclosed list of points) A winner is determined by the number of points accumulated either at the end of a pre-determined time period or a pre-determined total goal to be achieved.

WORD LIST

WORD	PTS FOR SPELLING	PTS FOR DEFINITION
Atmosphere	5	3
Conservation	5	4
Consuming	4	2
Culture	3	5
Cycle	5	3
Decay	3	3
Depletion	5	4
Ecology	3	3
Energy	3	2
Environment	5	3
Erosion	3	4
Evaporation	3	5
Evolving	5	2
Extinct	4	2
Fossil	3	3
Habitat	4	1
Human	1	5
Interdependence of Life	5	2
Multiple Use	4	2
Natural Resources	5	3
Non-Renewable	4	1
Organism	4	5
Pollution	2	2
Population	2	2
Precipitation	5	3
Producer	2	3
Recreation	3	1
Recycled	3	3
Renewable	2	2
Sewage	3	3
Soil	1	1
Succession	4	4

VOCABULARY TEST FOR FIFTH GRADE

MATCHING

1.	conservation	a.	everything around an organism
2.	consuming	b.	green plant that uses the sun's energy to make food
3.	decay	c.	the place where a plant or animal naturally lives
4.	evolving	d.	waste matter carried off by sewers
5.	fossil	e.	planned management of a natural resource to prevent permanent damage
6.	habitat	f.	remains of a plant or animal which has been preserved in the earth's crust
7.	interdependence of life	g.	not being able to be made new again
8.	organism	h.	upper layers of the earth's crust
9.	population	i.	plants and animals relying on each other
10.	producer	j.	the whole number of the same kind of plants or animals in an area or country
11.	sewage	k.	using
12.	soil	l.	natural changing
13.	succession	m.	to destroy by rotting or decomposing
14.	non-renewable	n.	living plant or animal
15.	environment	o.	the act or process of following in order

True or False

Place a T in front of the statement if it is true. Place an F in front of the statement if it is false.

1. Atmosphere is the whole mass of air around the earth.
2. Cycle is a series of events that recur regularly.
3. Depletion is the act of filling up something.
4. Ecology is the study of our feet.
5. Energy is the ability to do work.
6. Erosion is the process of building up.
7. Evaporation is the process of adding on or making visible.
8. Extinct is no longer existing.
9. Multiple use means to have only one use.
10. Natural resources are resources made by both man and nature.
11. Pollution is something that makes an item impure or unclean.
12. Precipitation is that which comes in the mail.
13. Recreation means to play or relax.
14. Recycled means the object is returned so it can be used again.

VOCABULARY

Given one school year 80% of the pupils will have increased their understanding of environmental vocabulary terms by an increase in the mean score by 7 points on a pre-post test basis.

ATMOSPHERE:	The mass of air surrounding the earth
CONSERVATION:	Planned management of natural resources to prevent permanent damage
CONSUMING:	Using
CULTURE:	The way the people of a particular country act or think at a given time time
CYCLE:	Series of events that recur regularly and usually lead back to the starting point
DECAY:	To destroy by rotting or decomposition
DEPLETION:	The act of emptying or using up
ECOLOGY:	A branch of science dealing with the interrelationship of plants and animals
ENERGY:	The ability to do work
ENVIRONMENT:	Everything around an organism
EROSION:	The process of wearing away
EVAPORATION:	A liquid changing to a vapor
EVOLVING:	Natural changing
EXTINCT:	No longer existing
FOSSIL:	Remains of a plant or animal which has been preserved in the earth's crust
HABITAT:	The place where a plant or animal naturally lives
HUMAN:	Man
INTERDEPENDENCE OF LIFE:	Plants and animals relying on each other
MULTIPLE USE:	Having more than one use

VOCABULARY

NON-RENEWABLE:	Not being able to be made new again
NATURAL RESOURCES:	Usable materials produced by nature
ORGANISM:	Living plant or animal
POLLUTION:	Something that makes an item impure or unclean
POPULATION:	The whole number of the same kind of plant or animal living in an area or region
PRECIPITATION:	Material containing water being dropped on the earth (Rain, snow, sleet, hail or mist)
PRODUCER:	Green plants that take the sun's energy, water, air and minerals, and makes food
RECREATION:	To play or relax
RECYCLED:	Returned to be used again
RENEWABLE:	That which can be made new again
SEWAGE:	Human waste matter carried off by sewers
SOIL:	Upper layers of the earth's crust
SUCCESSION:	The natural process of nature changing

ENVIRONMENTAL SCIENCE

Activity: School Environmental Science Survey

Discipline Area: Science

Grade Level: Junior High

Objectives:

1. By making a systematic survey the pupils will better understand how wastefulness adds to the solid waste problem.

2. Children will better understand that the problems of solid waste and conservation of natural resources can be attacked at the local level.

Activities: On separate sheet.

SCHOOL ENVIRONMENTAL SCIENCE SURVEY Activity # 4

You are to examine your total school site for areas of possible pollution and waste. Also areas of use where energy is used and/or misused.

The most used item in a school is by far the use of paper. You are asked to carry out a survey of areas and people in and around your school to check on the amount and use of paper and the amount and method of discarding waste in your school. Keep records for 3 or 4 weeks.

A. Restroom-- Ask the students in your class how many towels they used when they wash their hands. Record each day the amount used and put your results on a graph.

B. Classroom-- Between classes count the number of sheets of paper in the waste basket which have been written on only one side. Is there a big enough amount to call it wasteful? Keep a record for 2 or 3 weeks and record your results on a graph.

C. Office-- Ask the secretary how much paper she uses each day. Check the waste basket for paper that could be used again for scratch paper or for notes. If there is some that could be used again, ask her why she doesn't use it again. Record her answer.

D. Kitchen-- Ask the cooks how much food is wasted each day. What types of things are most often thrown away? What do the cooks do with the containers that the food comes in? If you feel that their method of disposing of the containers is not good for the environment ask them why they do it that way and if they think there could be a better way. If there is a better way, why don't they use it?

E. Janitor-- Ask him how many bags of paper he collects every day. How does he get rid of the paper? If you feel this way of getting rid of the paper is not good for the environment ask him why he does it this way and if he couldn't find a better way of doing it. Record his response.

F. Teacher-- Ask your teacher to keep a separate basket or bag for all the things he or she throws away during the school day. Do not let them change their habits, but just use a separate container. Look over the things thrown away to see if any of those things could realistically be reused. Look closely over the paper thrown away and count the number of sheets that were thrown away that could be reused. Record your count on a graph.

G. School Grounds--Count the amount of trash that is found on your school grounds (paper and cans). Keep a graph for each day of the amount of paper and the amount of cans you find. Notice day to day changes, try to

(over)

explain why. During the last recess of the day pick up all the trash.

Along with the school survey an interview with the local school Principal or Superintendent will help in your investigation of the energy crisis in your school. This can be done at a later date than at the time you do the items on Page 1.

You will have to write a letter to your Superintendent or Principal asking him to come to your class to answer the questions listed below. Enclose in your letter a copy of the questions and allow him plenty of time to respond to your request.

Have every thing well organized so it can go smoothly. Have people ready to ask questions and a person prepared to welcome him to the class and at the end of the interview to thank him for coming.

QUESTIONS

A. What kind of energy is used to heat our school?

Have we had trouble getting fuel? If yes, why?

B. Of the fuel we use how much do we use during a school year?

Could this amount be cut down? If yes, are we doing it?

If no, why not?

C. Are all classrooms and offices set at the same temperature?

If no, why not?

D. How much does it cost for electricity for this school building?

Where is the most electricity used? Why?

Are there places where we could cut down on our use of electricity?

If yes, are we cutting down and where are these places?

If there are places and we are not cutting down, why not?

If no, why aren't there any places to cut down on our use?

ENERGY

Activity: Uses of energy in the home

Discipline Area: Science

Grade Level: Intermediate and Junior High

Activities:

1. Children will be given a list of energy users in the home. Each will check whether it uses electricity or gas (or some other source), check if they have it in thier homes, and then ask their parents and grandparents (or someone of approximate age) to check those in their homes when they were children.

2. Children will learn the names of the companies supplying their energy.

3. Children will find out what each company uses as its source of energy, and where the company gets its supply.

Evaluation: Children will prepare graphs showing the growth in the use of energy from approximately 1915 to the present time.

A similar lesson could be made up for the uses of power on the farm, in shops, and in other businesses.

ENERGY USERS IN THE HOME

Appliance	Type of Energy	Now	About 1945	About 1915
stove				
lights				
refrigerator				
television				
radio				
water heater				
freezer				
clothes dryer				
fan				
furnace				
vacuum cleaner				
washer				
air conditioner				
hair dryer				
toaster				
fry pan				
organ				
dishwasher				
blender				
mixer				
toothbrush				
saw				
sander				
power tools				
garbage disposal				
garbage compactor				
blanket				
phonograph				
razor				
knife				
hedge trimmer				
garage door opener				
mower				
can opener				

Can you think of others?

HOW SOIL IS MADE

Activity: Soil study, How soil is made

Grade Level: Lower Elementary

Discipline Area: Science

Objectives:

1. Through experiments, children will learn how soil is made from rocks.
2. Children will learn how humus is added to soil.

Materials Needed:

1. Pieces of soft rock such as weathered limestone or sandstone.
2. Flat pans
3. Hot plate
4. Glass jar
5. Top soil from wooded area. This should contain decayed and undecayed material.

Activities:

1. Rub two soft rocks together over a paper. Observe resulting dust or sand grains.
2. Heat rocks in flat pan over a hot plate. Pour cold water over rocks or with tongs plunge them into cold water. Observe results.
3. This experiment will have to be performed when temperature is below freezing, or jar may be put into freezer. Fill a glass jar with water, screw a lid on tightly and put in freezing area. Leave overnight. Observe results.
4. Spread topsoil on papers. Observe different stages of decomposition. Observe any animal life.

Evaluation: Pupils write a paragraph recording results and conclusions from each experiment.

14

From: Environmental Education Center, Oteen, North Carolina)

Activity: Holiday Senses in Sentences (general)

Discipline: Language Arts

Grade Level: Primary

Objective:

1. Children will learn to use other senses than sight as an inspiration for poetry.

Learning Activities:

List on the chalkboard the uses of our five senses:

1. We hear with our ears.
2. We feel with our fingers.
3. We smell with our nose.
4. We see with our eyes.
5. We taste with our tongue.

Explain that each holiday time brings its own special enjoyment to one or more of our five senses.

Have students write sentences describing:

1. Sounds we hear at Christmas.
2. The colorful objects we see at Easter.
3. The feel of Christmas trees and ice and snow.
4. The smell of Thanksgiving Dinner.
5. The tastes present in a candy store or at the carnival.

15

From: Environmental Education Center, Oteen, North Carolina)

Activity: Poetry Fragrance

Discipline Area: Language Arts

Grade Level: Intermediate

Objective:

1. Children will learn to use other senses than sight as an inspiration for poetry.

Learning Activity:

Have students take a quick whiff from a small container of an unknown material with a pungent odor.

1. Hair spray
2. Cloves (spices)
3. Paint
4. Bleach
5. Perfume

(cont'd)

Discuss them until they are identified. Write on the chalkboard a four line poem relating to the smell. Have the class suggest the first three lines unrhymed.

Students can work out a fourth line to rhyme with the second line. Each student works out a four line poem about one of the smells presented or another he remembers.

Clove flavor's good in chewing gum
That's not allowed at school!
We like the taste a lot, you bet,
But gum's against the rule.

ACTIVITY: Pollution

DISCIPLINE AREA: Math

PURPOSE: To make the student aware of pollution he is contributing to the total community and U. S. problem.

CONCEPTS COVERED: 1, 2, 6, 7, 9, 11, 12, 13, 15, Pages 3, 4, 5.

OBJECTIVES: The student will:

1. be relating math to real life
2. develop an attitude for responsibility toward personal resourcefulness
3. suggest how increased population growth will affect the pollution problem
4. compute problems on pollution

LEARNING ACTIVITIES:

a. Invite a possible resource person from the local landfill site to explain the operation of the site.
b. Use the statistics presented in the following examples.

1) The population of our community is _____ and _____ tons of garbage per _____ (day, wk.) are collected.
What is amount of garbage collected in a month?

2) If you contribute 6 pounds of garbage per day, how much will you have contributed in month?_____ in a year? _____

3) 48 tons of garbage are taken to the landfill by a five ton truck, how many trips were made?_____

4) It took two years to fill 1/6 of the site, how many years will it take to fill the entire site at this rate? _____

5) The U. S. spends $4 billion on garbage collection and disposal. If $3,200,000 is spent for the collection, how much is left to spend for disposal?
_____

6) Rats are a problem at a landill site. If a femal rat has nine litters per year with 12 baby rats per litter, how many off-spring will she produce in a year?_____

7) Cars add to our pollution problem.
Four fathers drive to work daily to _____ (nearby city).
Each car uses 4 gallons of gasoline per day. How much gasoline could be saved if all four fathers rode in one car? _____

ACTIVITY: Wildlife Management (Birds)

DISCIPLINE AREA: Language Arts
Social Studies

PURPOSE: To help students realize that they can have an active part in wildlife conservation.

CONCEPTS: 12, 14, 15, pages 4 and 5.

1. Man has the ability to manage and change his environment for good or bad.
2. The careful use and management of natural resources is called conservation.
3. Wildlife is considered a natural resource. It is a necessary part of life and must be managed intelligently.

OBJECTIVES: The students will be able to:

1. construct and display 2 different types of bird feeders
2. read and follow directions which will enable them to build a bird feeder of their choice.
3. write a creative story explaining, from a bird's point of view, the difficulty of finding food.
4. construct and keep a diary concerning the birds he has observed.
5. name several species of birds.
6. tell that federal laws are necessary to protect the eagles in our nation, and why the "fathers of America" chose the bald eagle as a symbol of our country.
7. see that every state has a bird for one of its symbols.
8. research and debate the merits of the turkey vs the bald eagle as a national symbol.
9. identify the sections of the western hemisphere covered by each of the 4 major flyways.
10. make a quill pen.
11. tell the importance of the quill pen in American History.

LEARNING ACTIVITIES

1. Make a bird feeder using any of the following suggestions. Instruction for building feeders are at the end of this unit.
2. Write a story describing, from a bird's point of view, the problem of finding food for itself and its young.

3. The student will construct a diary having at least 8 pages, depending on the teacher's discretion. The left half of the page should be used for diary and the right half for pictures of birds observed that day.

4. Play "Bird" Game. This is similar to Fruitbasket Upset, except give the children names of birds.

5. Organize 2 groups; a bird group and a symbol group. Assign the bird group to research:

   1) Importance of the eagle to the balance of nature.

   2) Descriptions of the bald eagle and the American golden eagle.

   3) Eagle's environment, nesting and food habits

   4) Write to National Audubon Society for information about its program to protect the bald eagle.

   5) Write to the U. S. Forest Service for information about their program to protect the bald eagle on the National Forests.

   Assign the symbol group to research:

   1) Meaning of symbol

   2) Why symbols are used

   3) How symbols of America's heritage are used

   4) Where the emblem of the U. S. is used (Great Seal, President's flag, money)

6. Using poster board, draw or construct a large tree.

   Have each child choose a state and find the state bird, combine any states which have the same bird. The student should make a small colored replica of the bird to paste upon the tree.

7. Benjamin Franklin at one time said that the national bird should be the turkey.

   Divide your class into 2 groups. One group will be researching and debating on the merits of the turkey as the national emblem, and the other the bald eagle. (their debates could possibly be taped first)

8. Man has been aware of migration since ancient times. Early man did not doubt that large birds could make great flights, but he was puzzled at the disappearance and reappearance of small birds. As a result, several main theories were advanced.

   1) Transportation - According to this theory, small birds hitchhiked a ride "piggy-back" style on the backs of larger birds. Even today, one reads newspaper stories of Canadian geese carrying hummingbirds on their backs. These reports when investigated proved to be false.

   2) Transmotation - Aristotle, a most important naturalist of olden times, insisted that one species turned into a different species for part of the year. He claimed that the European robin changed into a European redstart for the summer.

   3) Trip to the Moon - An unknown Englishman in London, England, in 1703 introduced a theory that birds migrated to the moon on a trip that took only 60 days.

   4) Hibernation - Similar to some amphibians, reptiles, fish and insects, swallows were thought to bury themselves in the mud and hibernate for the winter. Studies in 1946 by Dr. F. C. Joeger in S. E. Calif. showed that a poorwill (a small night bird of the whip-poor-will type) can remain inactive in a deep sleep-like condition for 88 days. Whether this can be called true hibernation or not needs more study. Early theories have been replaced by new ideas resulting from scientific studies and data collected from bird banding. Still, the age old riddle of migration is far from solved.

   More than 1/3 of the world's species of birds migrate. In the Americas there are 4 major flyways 1) Atlantic, 2) Mississippi, 3) Central and 4) Pacific.

   Using a map of the Western Hemisphere have the students color in and label the 4 major flyways.

9. Each student should take a flight feather (these can be purchased in a craft shop) and cut off the end of the quill. Experiment with various juices, food coloring, bluing and other materials for ink.

   Find copies of various historical documents which were originally written with quill pens. Have each student make a copy of a section of one of these documents.

ACTIVITY: The Water Cycle

PURPOSE: To reinforce the concept of the water cycle.

CONCEPTS: 9, 13

OBJECTIVE:

1. The student will be able to label the steps of the water cycle.

LEARNING ACTIVITY:

1. The teacher could present the class with the following work sheet.

The Water Cycle

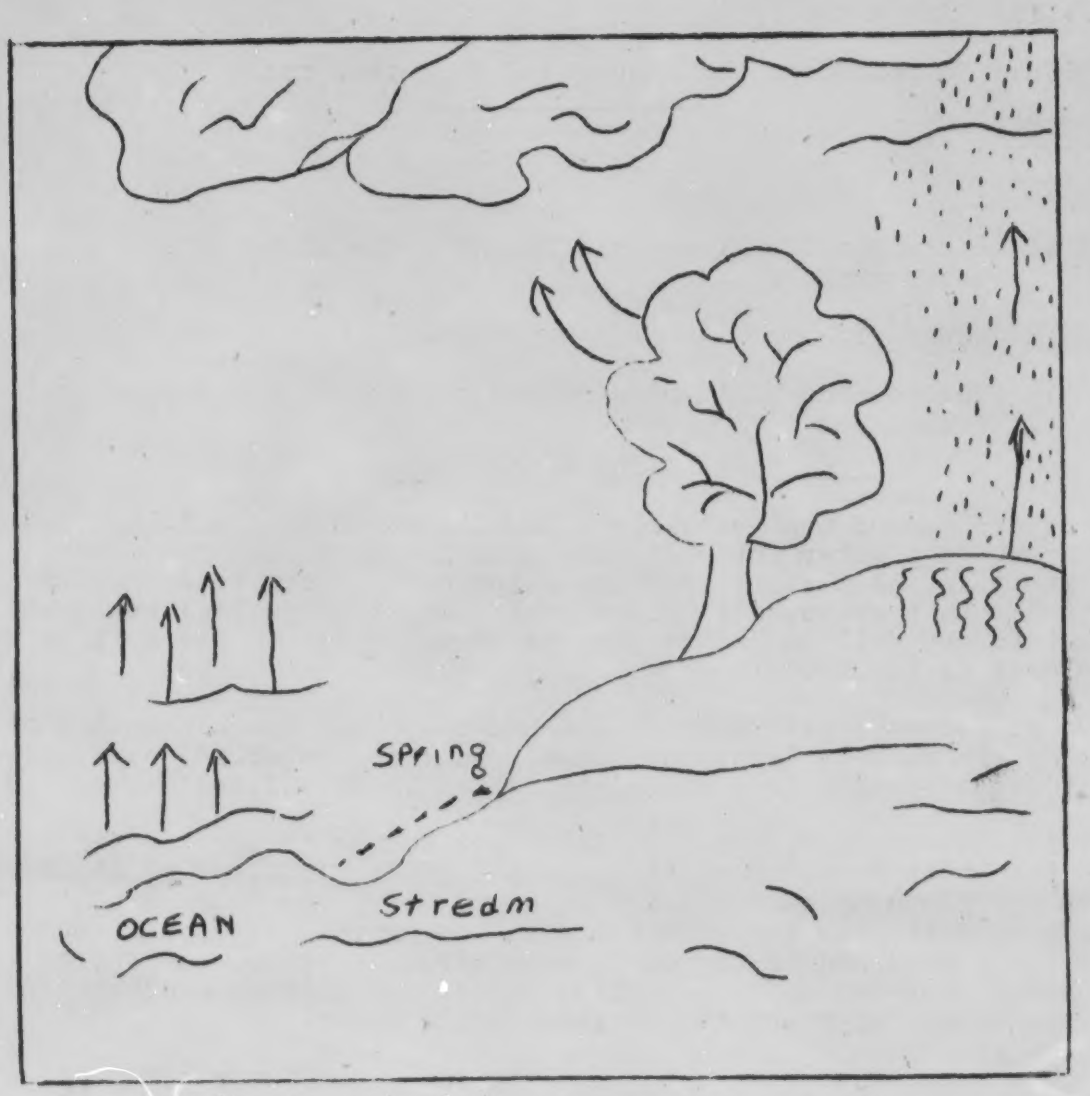
Water is our most valuable renewable resource. All life is dependent upon water for survival. Man has many uses for water. The freezing and thawing of water helps break rocks into smaller particles that eventually become soil. Water helps lead nutrients down into the soil so plants can use them. Water in the soil is used by plants to manufacture food.

Water renews itself through the water cycle. The elements that make up the weather (heat, pressure, wind, and moisture) cause precipitation, evaporation, and condensation in an endless cycle.

Because of heat, water in lakes and oceans evaporates and rises into the atmosphere. Here it cools and condenses, forming clouds which are blown by the wind. When clouds have too much moisture, it starts to rain. As the rain falls to the ground, some of it soaks into the ground and is stored in underground streams, caverns or in air spaces between soil particles. Underground streams often form springs when they reach the surface of the earth.

The water that does not soak into the ground runs off into streams or lakes and eventually into the oceans where some of it evaporates and returns to the air to form clouds again, repeating the cycle.

Plants also lose water through the leaves by a process called transpiration. Transpiration in plants is similar to perspiration in people.



Lable this picture of the water cycle, showing <u>evaporation</u>, <u>run-off</u>, <u>ground water</u> and <u>precipitation</u>.

New terms to be learned:

evaporation
transpiration
ground water
condensation
precipitation

<u>Suggested follow-up</u>:

Study of communities Water System
Stream Study
Discuss how man may interrupt the water cycle.

The following activities have been taken from Environmental Education Curriculum Guide Grades K-8. The guide is an activity centered instrument built around a flow chart of concepts and activities.

Air

The interdependence of plants and animals on the carbon-dioxide-oxygen cycle is necessary for maintenance of life.

1. Enclose a guppie in a test tube, closing off all air supply. (Observe)

2. Enclose a plant in a test tube, closing off all air supply. (Observe)

3. Enclose a guppie and a plant together in a test tube, closing off all air supply. (Observe)

Soil

A. Because of man's dependency upon soil, he has learned to increase soil productivity.

1. Discuss increase in the human population and its effect upon what the soil produces. Why must man make the soil work harder for him?

2. Get a soil map of Illinois and a soil survey report to observe how soils are distributed throughout the landscape.

3. Make a population map of a given area such as Illinois or the United States to show that people tend to settle where there is good soil.

4. Examine soil on: a steep hillside; a near-by, but well-drained location; a wet depression; soil along a stream. Note how they differ.

5. Learn the eight land classes. Why does different soil have different capability?

6. What can men do to the soil to increase soil productivity?

7. What are the two chief reasons that loams and silt loams produce better crops than sand?

8. Find out why farms in this locality have been abandoned.

9. Describe the land of this locality at the time the early settlers arrived. What were the primary purposes of the early settlers and how did these purposes affect the treatment of the soil?

B. By using good soil conservation practices, man can control soil erosion.

1. Divide the class into groups to discuss the various types of erosion. Discuss methods of combating erosion.

2. Discuss the interrelationship of: soil and plants, soil and water, soil and wildlife, soil and man.

3. Discuss these quotations by famous men: "Fields are no sooner cleared than washed", Thomas Jefferson, 1817; "He is the greatest patriot who stops the most gullies", Patrick Henry, 1790; "When the soil is gone, man must go", Theodore Roosevelt. Report on the following conservationists: Hugh Hammond Bennett, Clifford Pinchot, Theodore Roosevelt, Joseph T. Roghrock.

4. Make a poster of the Conservation Pledge.

5. Collect run-off water and determine what it carries.

Minerals

A. Man can build up mineral content in soil to improve productivity.

1. Visit a fertilizer dealer and obtain samples of fertilizers and literature describing the ingredients and source of each.

2. Plant 2 bean seeds--one in a sterile soil, and one in a fertilized sample. Observe the results and record them.

AREA II - LAND ACTIVITIES

III - LAND USE

Grades 5-6

A. Use, Misuse and Balanced Use (Solid Waste, Sewage, Land-Development, Land-fill, Water Shortage)

1. Study methods of solid waste disposal. What kinds of buried garbage will take the longest to disappear? See book "Pollution" Examining Your Environment, Page 22-23.

2. Make a mini compost pile to demonstrate how nature recycles organic materials and how inorganic materials resist decay.
   Materials needed:

   Two strong plastic bags, doubled up, with a "tie" (one-quart capacity bags work best).

Organic materials:	Inorganic objects:
kitchen refuse (fats and meats should be prepared for quick decomposition by chipping or grinding)	small plastic bottles, tubes, utensils
	babyfood jars
leaves or grass clippings	aluminum foil or pull-tabs
old bread or pastry	
"leftovers" from a meal	
woodchips or sawdust	
bedding from an animal cage	

   Procedure:

   a. Shred the garbage as much as possible (Use a kitchen blender, an old meat grinder, or an onion mincing gadget.) Then put the materials, into the bag, including one or two inorganic objects, and mix them up thoroughly. Moisten the bag's contents to the consistency of a damp spong.

   b. Open the bag once a day and stir the garbage. This allows oxygen to reach all parts of the heap. The bacteria and fungi need air to break down the garbage into compost.

   c. Have the students keep a record of the progress of decay, observing which materials decay the fastest. Also note the form of the inorganic objects after all the garbage decays.

d. Discuss the value of compost as a natural fertilizer and its practical use in the garden, flower beds or around trees. Suggest that those students who have gardens start a compost pile in their backyard.

e. Although man knows about nature's life supporting cycles, he doesn't always cooperate with them. Instead, he disrupts them for his immediate economic gain. He manufactures decay-resistant products such as plastics, aluminum cans and glass. He invades natural concentrations of raw materials such as mineral lodes and forests, scattering these materials throughout the world in the form of various products which he eventually discards. But even materials like glass, aluminum and plastic can be given a complete life cycle of their own.

(see "Recycling-Rodale Press" for additional experiments.)

3. Make a survey of the trash from one school day or one day at home.

4. Visit sewage plant.

5. Plan or make (clay, paper mache or boxes) a model city.

6. Build a mini land-fill:
Set up a simple experiment, to see what goes on inside a landfill, under the surface layer of soil. To do this, get three or four clear, transparent, tall glass or plastic containers. Use kitchen refuse, such as potato peels, stale bread, apple cores, etc. Do not include protein items such as cheese or meat because of the odor. Cut into small pieces no bigger than 1/2" x 1/8". Bury 5 pieces at different depths. Within a few days, mold growth will begin to develop. Keep a record of how rapidly the different garbage items decompose in the "mini" landfill. Can you detect organisms other than molds? After some of the garbage materials are decomposed, you may notice empty spaces where they were. How can you account for those empty spaces? Are they really empty? Is there anything at all in these spaces? What happened to the bulk of the garbage materials which originally occupied these spaces? Where did those materials go?

(See Teaching Science with Garbage, Rodale Press for setting up "Mold Gardens and Land Fill Activities.)

AREA III - WATER ACTIVITIES

Grades 5-6

A. Rapid population increases in local communities sometimes create severe water supply problems. Ocean water may have to be used in the future.

1. Discuss who uses water in your community. (private citizens, industry, agricultural areas.)
2. Make a chart or graph showing how an increase in your community's popuation would affect the water supply for home and industrial use.
3. Have a man from the water department come into the classroom and speak. What does the water department do to combat water shortages which may occur during a summer drought?
4. Discuss methods for converting sea water to fresh water and extracting minerals from sea water. What are the most economical methods?
5. Discuss how communities can regulate water for their population.
6. Visit the city water supply system and/or sewage disposal plants.
7. How do other states, with a less abundant water supply than Illinois regulate their water?

B. Water resource management must determine how to reduce water pollution and must consider water reuse potential if needs in the future are to be met.

1. Have a child write the Agricultural Extension Service or the Soil Conservation Service, for bulletins on rural water installations, rural sewage disposal plants, helps in developing drainage plans and programs.
2. Find out what Illinois industries have a water purification plant on or near their site to make their waste water reusable.
3. Write a paper, or have a bulletin board project showing the causes of water pollution and its effects.
4. Show and demonstrate the use of purification tablets such as are in camping kits. Why are these needed?
5. Have pupils "run for office" and list the planks included in their platform for the elimination of water pollution.

Animal Life Activities

A. Man has often upset the balance of nature. He is learning, by study and research, how to use the wildlife but still maintain a balance.

1. Discuss what happens when man misuses wildlife resources. Learn what happened early in the United States history when hunting and trapping were not regulated by law.

2. Read to discover which animals in Illinois are protected by law. Learn which species are extinct, or extirpated. Discuss why these protection laws are necessary.

3. How does man alter the wildlife environment when he builds homes and plows for farms? Discuss the implications of such practices.

4. Discuss how man can easily upset (and already has to some degree) the balance of nature by developing more and more toxic insecticides to which insects eventually become immune.

Plant Activities

A. All nations in the world must have ready access to plants in order to flourish.

1. Make a map showing the ancient civilizations, such as Egypt, and their trade routes to Greece, Crete, and other nearby peoples. Discuss why people chose land in which they settled.

2. Discuss how the westward expansion of our country depended on plants and plant products.

B. Plant management practices influence man's culture.

1. Discuss and list products made from wood that have changed aspects of man's way of life in this century: a) lumber (shingles, boards, handles, shoe heels, houses, furniture); b) slicing (veneer, utensils, toothpicks, plywood, etc.); c) extraction (dyes, tanning, pitch, charcoals); d) grinding and cooking (paper, plastics, lacquer, rayon, etc.); e) hydrolysis (glycerine, yeast, alcohol, butadiene, etc.); f) by-products (bark, fruit, syrup, sawdust, etc.).

2. Prepare line graphs showing: Population growth in the U.S.; wood-use per person; wood-use by the nation.

ENVIRONMENTAL CAREER EDUCATION INTERVIEW

In this unit students utilize the techniques of interviewing to study environmental careers, such as jobs concerned with land, water, air, and all living things. They may also develop an awareness of environmental problems.

The basic procedure to be followed is for the third grade class to interview an ECO-Center instructor. During the interview children will ask questions to find out about: the individual, the job, other careers in the environment, and environmental problems.

Portions of this unit have been adapted from CASE a program of career awareness and self-esteem developed in Thomson Community Unit # 301.

THINGS TO DO BEFORE THE VISIT

1. Discuss with the class why an ECO-Center instructor is visiting their classroom and what they may expect to gain from it.
2. Discuss and try out the interview technique.
3. Develop a set of questions with the children to use during the interview. Each child should have a responsibility. Four areas to consider in asking questions:
   a. About the individual - Why is he or she in this kind of work? Background?
   b. About the specific career - What does it involve?
   c. About other environmental careers - What are some other environmental careers?
   d. About environmental problems -- What are some of the problems?

   (Your class may wish to concentrate on one or two areas, as these four areas may be too broad. Children will also want to ask additional questions.)
4. Establish guidelines for proper conduct during an interview.

TECHNIQUES TO USE DURING THE INTERVIEW

1. Teacher serves as moderator.

2. Introduce guest.

   Visitor will be either:

   Mr. Dennis Etnyre
   Director - Upper Mississippi River ECO-Center Environmental Education Cooperative
   Assistant Regional Superintendent of Schools Carroll County

   or

   Mr. Bruce Floyd
   Instructor - Upper Mississippi River ECO-Center Environmental Education Cooperative
   Title III Program Disseminator

3. Have the class seated in rows or a semi circle. Provide a seat at the front so the visitor will be on the same level as the students.
4. Each child should have a headband or name tag so the guest is able to call upon him by name. Headbands work nicely.
5. Have questions made up before the visit. Each child may have certain questions or a complete list. Each child should have responsibility to ask certain questions.
6. Moderator should conclude interview and be a guiding influence if necessary.

WHAT TO DO AFTER THE VISIT

1. Interview other people in your community with environmental careers such as:

Naturalist	Sanitary Engineer
Park Ranger	Extension Advisor
Forester	Weather Reporter
Soil Tester	Soil Conservationist
Farmer	

2. Interview other adults in the community with interesting careers or hobbies that relate to classroom studies. It may be possible to visit their place of work.
3. Contact your county film library for related films.
4. Contact your librarian and guidance counselor for related materials.

OBJECTIVES FOR THIS UNIT

1. Developing interviewing skills.
2. Developing an awareness of environmental careers.
3. Developing an awareness of what can be learned outdoors.
4. Developing an awareness of current environmental problems.
5. Encouraging students to interview other adults to become aware of other careers that relate to their classroom studies.
6. Active student participation in the learning process.

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The following ideas and goals are taken in part from the CASE program implemented in Thomson Elementary School during 1974-75. Contact Rick Ginie, Counselor, for further information on other units.

CASE

(Career Awareness and Self Esteem)

The main ideas upon which the program is based;

1. By developing an awareness of careers and good feelings about oneself (confidence), students will make better decisions about events in their life both now and in the future.

2. Teacher is the curriculum. They decide how their class is to operate and what materials the student needs to learn. Therefore, our CASE program is based on that idea.

3. Career education must involve the community and its members.

4. Children must take an active role in the learning process. From being involved the child will begin to understand himself, as he is developing in relationship to the real world.

5. Adults must be used in a career awareness and self-esteem program. Parents and teachers serve as models for children, so that child can develop his personality. We need to expose students to real adult models.

6. Our project must be intergrated into the present curriculum. Career education and academic education are not separate; one compliments the other.

Student Goals:

1. Be involved in a Career Awareness and Self-Esteem Program Students will develop a clearer understanding of themselves, their likes and dislikes, their abilities, skills, and be able to utilize these in their lives.

2. Become more activiely involved in making decisions.

3. Develop an understanding of careers in their community.

4. Develop a respect for others and the work they do.

5. Relate their immediate experiences and decisions to their personnal and career development.

6. See the connection between school and the real world.

To aid your class in developing techniques, the following material on "The Interview" from CASE is reprinted in this package.

THE INTERVIEW

Interviewing is a technique school children have been using for years. They have used it to make friends and to get along in the world. With some direction, children can become very skillful in interviewing classroom visitors. Interviewing provides an opportunity to talk with adults and fosters self-esteem and feelings of acceptance. Self-esteem grows out of the fact that adults serve as models for children.

Interviewing skills can be developed by role-playing. Practice interviews with members of peer groups; practice interviews at home, and tape-record those practice interviews. Students could first be encouraged to interview their own teachers so that appropriate and inappropriate questions could be discussed. For example, one first grader learned that it was appropriate to ask a visitor if he had children, but inappropriate to ask <u>why</u> he didn't.

The Interview

Introduction:

I. Discuss the idea of talking with people through the use of an interview.

   A. The following questions and suggestions will assist students to learn about an interview. These sessions will be led by the teacher.

      1. What is an interview?

      2. What are some jobs related to interviewing?

      3. If you had a chance to ask anyone a question whom would you ask? What question would you ask them?

      4. Teacher might discuss the kinds of questions not to ask and the importance of the wording of a question.

   B. Following this introduction, the students and teachers will make a basic list of questions. These questions will vary from speaker to speaker.

II. Practicing interviewing skills:

   A. Students can roleplay the interview with each other. This can serve to teach a student about a specific career, as he pretends to be that person. This will build the student's confidence in his interviewing ability.

   B. Tapes of practice interviews should be made by students and evaluated.

   C. Students should then interview someone at home or in school.

   D. Encourage students to evaluate and revise their list of questions. Questions that have been prepared by the students will be confortably communicated by the interviewer.

III. Students and teacher will establish guidelines for proper conduct during an interview.

   A. Seating in the room is important as this will effect the conversation.

      1. Depending on the class size, a semi-circle or circle would facilitate the discussion and provide better eye contact.

B. It is helpful to the speaker to know students' names. Have students make their own ID's, hats, head bands, name tags, or names on desks.

C. Everyone talking at once can be very confusing. Have students practice discussion without raising hands or learn to raise hands at the proper time.

IV. Practice active listening in class.

A. Show external signs of listening by eye contact, nodding appropriately, smiling, gestures, posture.

B. Ask open-ended questions.

C. Ask specific questions to clarify what the other means to say, to help him put into words what he wants to communicate.

D. Allow for times of silence and thought. Calm silence is trust building. Don't feel you have to jump in everytime someone stops talking.

E. Observe signals that people want to talk: Leaning forward, moving in their seats.

R. Rephrasing of students' words shows listening. The teacher will serve as the model so students can learn active listening skills. Listening helps students gain self-acceptance, and self-confidence.

V. The student and teacher will seek out community resources.

A. Use your resources within your room, such as a <u>new</u> student, student with a hobby, or school personnel.

B. Check resource file in counselor's office of all letters returned; call parents.

C. Have students write personal letters to the speakers. Letter should include:

1. <u>What</u> they want him to speak on. A list of possibilities should be <u>sent</u> to the speaker.

2. <u>When</u> he is to speak.

3. <u>Why</u>? What does the class want to learn.

4. Explain he is to <u>dress</u> as he does at work. Also bring any of work tools that would better illustrate his work.

5. Feel free not to answer any objectionable questions.

6. State questions that deal with work and his feelings.

7. A following letter should confirm date and time.

D. Evaluation of what students learned should be carried on after each interview.

VI. General helps

A. Audio-visual aids can be used.

B. Send members of your class to another class to tape their interview.

C. Interviews may be conducted in small groups.

D. Follow-up activities of interviews my be:

1. Vocabulary, spellings, crosswords

2. Visit to a place of employment

E. Always write thank you notes.

C A R E E R V I S I T S

Developing interview skills makes career visits more valuable. Career visits can further the child's experience by:

1. Relating school to the outside world.
2. Allowing the child to see adults in the community at work.
3. Giving the child the opportunity to develop social skills through cooperation and joint planning.
4. Helping the child to determine his likes and dislikes and expand his possibilities.
5. Teaching group and individual responsibility.

Mrs. Jecklin
3rd Grade
Interview questions

1. Why did you choose this job?
2. What do you do when you are at work?
3. Do you work 9 months of the year or more at your job?
4. What kind of training have you had for your job?
5. What are the advantages of your job?
6. What are the disadvantages of your job?
7. How long have you worked on this job?
8. Do you have worries in your work?
9. Do you have any hobbies?
10. Do you have a part-time job?
11. Does your family know much about your job?
12. What work did you do before you took this job?
13. If you could have any work in the world, what would you like to do?
14. Are there any personal dangers in your job?
15. Do you have to wear any special clothing in your job?
16. Do you get acquainted with a lot of people through your job?
17. How do you have to be dressed for your job?
18. What did you learn in school that helps you in your present job?
19. What time do you go to work, what time do you leave work?
20. Do you have a coffee break?

From our experiences the following information from the Peoria Project has proved helpful.

SUGGESTED INFORMATION FOR CLASSROOM GUESTS

General Purpose:

To provide children an opportunity to meet and interview adults and to inquire about their careers.

Attire:

Wear uniform normally worn to work. Explain its purpose and value. (include any safety equipment worn).

Tools, equipment, and Samples of Work:

Bring that which is most useful or important on the job. Use same in actual presentation.

You will probably be interviewed by students in the class. During the interview the following points are likely to be considered:

1. Explain a typical day of work.
   a. Stress the routine as well as the divergent aspects of your work.
   b. Storytelling can be valuable. Relate interesting incidents from work.
   c. Clarify what you like most and least about your work.
2. Explain what personal satisfactions make the job worthwhile to you.
3. A general idea of salary. Vacation time and other benefits are also interesting at this level.
4. Explain education and experience required.
5. Discuss any definite safety and danger features on the job.
6. When possible, use slides, films, charts, and other audio-visuals.
7. Technical terminology should be used but must be explained. Involve teachers too, ask them to help explain.
8. Discuss why you chose a particular career.
9. If your job is seasonal, explain the effect of weather or seasons.
10. If possible, give suggestions as to where students are free to write letters to obtain additional information.

YOUR VISITATION

BEFORE TEACHER

1. Select general area for study. (For example, school, health, post office, etc.)

9. Make personal contact with the individual.

10. Upon receipt of confirmation of visit, send information sheet for classroom guests. (see attachment)

11. Arrange for permission and transportation as necessary.

12. Prepare activities to integrate this experience with your curriculum.

DURING TEACHER

1. Serve as moderator

AFTER TEACHER

4. Implement activities to integrate this experience with your curriculum. (See sample activity units)

BEFORE TEACHER-STUDENT

2. Have children suggest all possible people they could interview.

3. Do more research to add to the original list of people.

4. Eliminate people who would be unavailable.

5. Have students decide whom they want to interview and explain why.

6. Decide if the individual should come to the class or if the class should visit the individual at his place of work.

7. Decide if the whole class should be included in visitation or if individuals or small groups should be selected to go as representatives.

8. Children, with teacher guidance, write letter to person or business to set up a visit.

DURING TEACHER-STUDENT

1. Conduct interview.

AFTER TEACHER-STUDENT

1. Evaluate visit. Listen to tape recording of visit, if one is used. Were their questions answered? What did they learn? How well did they plan? What will they do differently next visit?

2. Discuss interview and decide if any attitudes and ideas about this occupation have been changed.

3. Further explore the occupation area and promote self-esteem through magic circle discussion. e.g., Why would/ would not like to do this job?

5. Write thank you letters to the individual.

School Site

The school grounds is often a learning area that is overlooked. This section provides some activities which can use the school site.

Again, as in the classroom activities section, you as the leader should choose a number of activities and do them with the teachers as they would with their own children.

Use of the school site can be a good learning experience for the teachers. It can give them a chance to practice using the out-of-doors as a learning area. The school grounds is just outside the door, no need for a bus, no need for permission to use the property, and no need for additional people for help with supervision. The school site is a valuable asset to the learning experience.

School Site Activities

The purpose of this section is to provide the teacher with some examples of activities that could be used on the school site or in the immediate community. These activities are in worksheet form so they may be copied directly.

ACTIVITY: Art on the School Site

DISCIPLINE AREA: Art

PURPOSE:

1. To increase children's powers of observation.

2. To increase children's understanding of interrelationship between art and nature.

3. To acquaint children with use of natural objects in art projects.

OBJECTIVES: The children will demonstrate their understanding of relationship between nature and art by completing a project using nature materials.

LEARNING ACTIVITIES:

In order to achieve creativity children should choose an area in which they plan to work. Care should be taken that no rare or protected species is used and the ecology of the area is not disturbed.

Areas in which they may choose to work include:

posters
dioramas
weaving
sand paintings
seed pictures
dried material arrangements
painting with natural dyes
figure construction using burs, clay, sticks, etc,
collages

Some Ideas (From Nashville Metro Schools Environmental Education Department)

1. Discovering shapes and patterns are very important as a first step in arts and crafts. The many colors and shades of colors along the trail can help the child understand more about colors. Using homemade clipboards, let the children try outdoor sketching, trying more for shape and feeling them for details. The many shapes found in nature can help children to learn to draw using shapes and then refining them. Heart shaped leaves, triangles, square stems of the mint family, and circles can be used to try design pictures that can later be made into more finished pictures.

2. There are many things in nature that can be used to make pictures. If each child takes a plastic bag with him around the school grounds he can pick up twigs, stones, bark (not from a living tree), dried grasses and seed pods. This also gives the leader a good chance to teach about conservation--leaving things for other people to see, and not picking flowers unless they are weeds in a field.

Art Ideas (cont.)

These materials can be taken back to the school and be combined into a picture. Use heavy cardboard or wood as a backing. Stick men and animals are easy to make. Stones can be used for heads, and shapes of stones used for ducks or whatever they appear to be. Maple wings make good bird wings or fi[illegible]. Caution the children not to pick green things to use in their picture as these will soon dry. Usually there are many dry grasses along the trail that can be used as trees or grass. Dry leaves can be cut to make dresses and bodies. Log cabins ar[illegible]sy to make with twigs and bark roof. Small rocks can be used t[illegible]ke the chimmey.

3. Small rocks can be painted to look like "bugs". Use pipe cleaners as the antenna or find dry grass with an end on it. Good insect books will have many ideas for the children. The Ladybird beetle is a good simple one to try.

4. Leaves can be used to make many kinds of prints. One of the simplest ones with children is a crayon print. The leaf is put, vein side up, on a piece of cardboard. Put a thin piece of paper over the leaf and rub with a crayon. Several colors can be tried to get different effects. Overlapping leaves will also make an interesting design. These designs can be used in making letter paper, Mother's day cards or put on the front of a scrapbook.

5. Scrapbook covers or placemats can be made with wax paper. Leaves can be ironed between two pieces of paper and the edges cut with pinking shears to produce a nice edge. Clear contact paper is the new way to show off leaves and other natural items. The items should be put on the clear contact first and then the contact paper put on the backing and smoothedtowards the edge. Seeds and other natural objects can be used with the contact paper.

6. Collecting spider webs: Materials needed include spray paint (white) dark big construction paper and a pair of scissors. Try to find a spider web that is on a fence or is open so you can reach it. Spray the white paint on the web. Put the dark construction paper up against the side of the web part, then remove the paper. The paint will make the web stick to the paper and show its design. In order to preserve it use a coat of plastic spray. There are many patterns of spider webs and these can be used in insect study as well as a decoration for the room.

7. If there is a study of the American Indian there are many crafts that will help teach the interesting history of these people. The children can paint like the Indians did, using either soft rocks (usually chert) ground into a powder with linseed oil added to make the paint. This of course makes only earth colors, so the children may want brighter colors for their picture. If there is a field or open area along the trail or in the school yeard many weeds can be found. Let the children draw an outline of a picture and then use natural colors to "paint" it. They should tear up the leaves, flowers, etc. before using them in order to get to the coloring matter. Be sure they use only weeds. The dandelion makes a beautiful yellow.

8. Natural dyes can be made from many things found on most school sites-poke berries, walnut hulls, and other plants can be used. Use big white handkerchiefs and try tie-dying. These can then be used as cowboy or pioneer scares.

ACTIVITY: Environmental awareness and vocabulary study

DISCIPLINE AREA: Language Arts

PURPOSE: To help the pupil broaden his vocabulary and improve spelling by observing his environment.

OBJECTIVES:

1. The pupil will demonstrate his increased awareness of the school environment by naming and spelling correctly at least 50% of the words in the activity.

LEARNING ACTIVITY:

1. Equipment: Each pupil has a worksheet and a pencil.

   Directions: Look around you. List as many words as you can find that begin with the letters in the left hand column. In the right hand column list words that end with those letters. If you do not know how to spell them, find the correct spelling.

1.	b	1.	t
2.	c or ch	2.	n
3.	g	3.	m
4.	t	4.	h
5.	i or in	5.	g
6.	n	6.	w
7.	r	7.	p
8.	s	8.	k
9.	m or ma or me	9.	e
10.	sa	10.	r
11.	se	11.	l
12.	a	12.	d
13.	l	13.	f
14.	w	14.	s
15.	p or pl	15.	b
16.	h		
17.	wo		
18.	y		
19.	f or fl		
20.	d		

2. List words that contain the following vowel combinations.
   o and e (example stone)
   u and i
   e and e
   a and e
   i and e
   vo
   vu
   a and o
   ee
   oi
   u and e
   ai

   Really hard ones

   u and a and e
   a and o and e
   i and e and a
   u and i and a

ACTIVITY: Plant and animal identification

DISCIPLINE AREA: Language Arts

PURPOSE: To broaden the pupil's ability to observe and name animal and plant life which is part of his environment.

OBJECTIVES: The student will show an increase in his awareness of the plant and animal life of his environment by identifying at least 50% of the plants and animals or animal signs found on the school site.

LEARNING ACTIVITY:

School Site Study

Each pupil has a chart to be filled in. Some school sites will be richer than others, but all should be able to fill part of the chart. Animal signs may be used. This is a good exercise in the use of reference works.

Mammals	Birds	Insects & Other Animals	Plants

ACTIVITY: School Site - Mini-Climates

DISCIPLINE AREA: Science

PURPOSE: The student will recognize that natural areas and man-made structures create local climatic conditions.

OBJECTIVES: The student will:

1. demonstrate his ability to investigate temperatures on different surfaces.
2. will recognize reasons for differences in temperatures in sunlight and shade.
3. will recognize that colors affect the temperature.
4. will recognize that air movements affects the temperatures.

LEARNING ACTIVITY: Mini-Climites

Even on a school site there are many different temperatures. The differences might be as much in this one area as between two states such as Maine or Arizona. The Little or micro-climate is the layer of air near the ground. Even here the difference in wind speed, temperature, humidity and moisture may be as great as changes all over the country. This difference will affect what animals and plants live there.

Pick several different areas on the school site - - - Pick several in the sunlight and several in the shade - - - Measure the air temperature 1 inch above the surface (allow five minutes for each reading - - -

	grass	bare dirt	concrete	asphalt
Sunlight temp.				
shade temp.				

Why do you think the temperatures will be different? _____Put a white sheet of paper under the thermometer on the asphalt in the sun and take another reading. Is it the same as before?_____Why? _____

Take two cans, take the paper off of one so it is shiny. Paint the other black - - - Fill both with water. Put them into the sun for 1/2 hour. Which has the highest temperature? _____What made it be higher?_____Why would the grassy area be cooler than the concrete or asphalt?_____What is in the soil that keeps that area cooler?_____Find an area on the school site about a yard square - - - Take several readings. Are they the same?_____Why not?_____Dig down into the ground and take a reading. Is there a difference? _____Does wind have an affect on temperature?_____Take temperature in an open area (affected by wind) _____Take temperature in a protected area (no wind)_____ What is your conclusion about the effect of wind on temperature?_____ _____

ACTIVITY: School Site - Tree Study

DISCIPLINE AREA: Science

PURPOSE: To recognize the importance of trees in our environment.

OBJECTIVES: The student will:

1. be able to differentiate between deciduous and evergreen trees.
2. recognize fruit of trees as means of reproduction.
3. recognize the planting of trees as part of a landscaping plan.
4. recognize difference in growth patterns.
5. recognize the interrelationship of trees and animals.

LEARNING ACTIVITY: Tree study

Answer these questions:

1. How many trees are there on your school site?_____
2. How many DIFFERENT kinds of trees? _____
3. How many are deciduous? _____How many evergreen? _____
4. Pick out the largest tree and measure its circumference.____
5. Pick out the smallest tree, use a tape measure and measure the circumference about three feet above the ground._____
6. Are these trees of the same kind? _____Is one evergreen? _____
7. How do you think these trees got to be where they are standing? _____
8. How many of the trees have "pretty flowers? _____
9. Name as many "fruits" of the trees as you can. _____
10. How does each kind of tree help animals? _____

ACTIVITY: School Site - Insects

DISCIPLINE AREA: Science

PURPOSE: To introduce to the students various aspects of insect life on their school grounds.

OBJECTIVES: The student will during a ten-minute hike:

1. identify three types of insects.
2. find insect eggs.
3. find evidence of insect eating habits.
4. find evidence of insect effect on plants.

LEARNING ACTIVITY:

Preparation:

1. List insects you may possibly see on trip.
2. List places to look for insects.
3. Learn to identify insect eggs.

On Field Trip:

1. List insects seen or briefly describe so they may later be identified.
2. Collect evidence of insect work.

ACTIVITY: Lawn Study

DISCIPLINE AREA: Science

PURPOSE: To investigate the interrelationship of the communities found in a lawn.

OBJECTIVES: Upon the completion of the lawn study the student will be able to:

1. identify the two basic communities found in a lawn.
2. write a paragraph stating three ways in which an area of heavy use is the same as an area of light use and three ways in which it is different.

LEARNING ACTIVITIES:

Equipment needed: notebooks and pencils, handlens.
Procedure:

Divide class members into pairs, each pair to study a yard square plot.

1. List the plants found in your plot. Which plant is the most common?
2. List insects found in your plot. Which insect is the most common? (It would be helpful if the student drew pictures of any unknown plants or animals for later identification.)
3. Is there any other animal life present? If so, what?
4. Are there any unnatural objects on your plot? If so, what?
5. Is your plot in a heavily traveled area, a lightly traveled area, or an unused area?
6. How has heavy traffic affected:
   a. grass?
   b. weeds?
   c. flowers?
   d. insects?
   e. other animal life?
   f. soil?
7. How has light traffic affected:
   a. grass?
   b. weeds?
   c. flowers?
   d. insects?
   e. other animal life?
   f. soil?
8. How does the lawn differ where there is no traffic?
   a. grass?
   b. weeds?
   c. flowers?
   d. insects?
   e. other animal life?
   f. soil?

ACTIVITY: School Yard Census

DISCIPLINE AREA: Science

PURPOSE: To help the student develop an awareness of the infinite variety of natural and man-made objects which are part of the school site environment.

OBJECTIVES: The student will

1. demonstrate his power of observation to identify natural and man-made objects on the school grounds.

2. display his aesthetic values by pointing out those items which have low aesthetic value and those which have high aesthetic value.

LEARNING ACTIVITY:

Student worksheet on the following page.

Census

Many of you may have heardof the "people" census that the government takes every 10 years. On the school yard there are many living things. There are also many things that man has put on the school site. Below is a check list. Take a walk around your school yard and check off all of the things you see.

Plants or Animals

ant or ant hill _____
squirrel nest _____
wasp nests _____
holes in ground made by insect _____
bird nest _____
bird _____
animal print _____
half eaten leaf _____
spider _____
earthworm _____
grasshopper _____
bee _____
insects on bark of tree _____
pill bug (sowbugs) _____

dandelion _____
clover _____
wild strawberry _____
sour grass _____
moss _____
shrub _____
vine _____
a yellow weed _____
lichen _____
gall _____
evergreen _____
broadleaf tree _____
mushroom _____
tree fruit _____

flagpole _____
fence _____
telephone pole _____
sidewalk _____
parking lot _____
play area _____
trash cans _____
fire plug _____
stop signs _____
bicycle rack _____
gutter _____
light meter _____
transformer _____
cement area (blacktop) _____

Which animal do you think is the most numerous on the site? _____

Which plant has the greatest number? _____Why does this plant grow so well on the school site?

Which of the man-made items are pretty?_____Which are ugly?___
Could the ugly ones be made better looking? _____How? _____

ACTIVITY: School Site Use

DISCIPLINE AREA: Math

PURPOSE: To help the student develop his sense of estimating distance and his ability to work with different types of measurements.

OBJECTIVE: The student will:

1. demonstrate his ability to estimate length, width, height, diameter and weight.

2. demonstrate his ability to use different tools and skills to determine the actual length, width, height, diameter or weight of item.

LEARNING ACTIVITY: Math-in-the-out-of-doors

MATH IN THE OUT-OF-DOORS

DISTANCE AND HEIGHTS

1.	Guess what the distance is between the street and the front door of the school.	Your guess Actual	_____ meters _____ meters
2.	Guess the width of the school	Your guess Actual	_____ meters _____ meters
3.	Guess the height of the school	Your guess Actual	_____ meters _____ meters
4.	Guess the weight of a rock	Your guess Actual	_____ grams _____ grams
5.	Guess the length of the swing set	Your guess Actual	_____ meters _____ meters
6.	Guess the height of the flag pole	Your guess Actual	_____ meters _____ meters
7.	Guess the circumference of a tree	Your guess Actual	_____ meters _____ meters
8.	Guess the height of the back door of the school	Your guess Actual	_____ meters _____ meters
9.	Guess the weight of a block of wood	Your guess Actual	_____ grams _____ grams
10.	Guess the weight of a friend	Your guess Actual	_____ grams _____ grams

(It will be necessary to have a tape measure handy so the children can measure the actual distance. Some helpful hints on how to measure heights are also nice to have.)

ACTIVITY: School Site Problems

DISCIPLINE AREA: Social Studies

PURPOSE:

To help the student recognize his responsibility in solving problems and developing the tools to solve the problems.

OBJECTIVES: The student will:

1. demonstrate his ability to collect and classify litter.
2. demonstrate his ability to discover areas of problems on his school grounds.
3. demonstrate his ability to develop solution to problems on his school grounds.

LEARNING ACTIVITY:

Student check sheet on the next page.

SOCIAL STUDIES

Litter is one of the worst problems we now face. The manufacturers make so many things and most of the packages are thrown away. We have so much that we often do not think about throwing things away. Below is a list of some litter that might be found on your school yard. Divide in groups. Take a litter bag. Have one person as a recorder. As you pick up the litter record it on the check sheet The second list is of problems that you might have on your school site. Check any you see, then, as a group, try to figure out how you and the other classes might correct the problem.

Litter		School Site Problems - What to do	
broken glass	_____	low wet places	_____
cans	_____	soil erosion	_____
paper	_____	no grass cover	_____
plastic materials	_____	overflowing trash	_____
bottles	_____	cracked sidewalks	_____
bottle or can tops	_____	holes in street	_____
crayons or parts of pencils	_____	broken street lights	_____
rubber bands	_____	peeling paint	_____
pieces of cloth	_____	old odors	_____
pieces of metal	_____	car or bike ruts	_____
milk cartons	_____	gravel getting on grass	_____
garbage	_____	broken windows	_____
pieces of old toys	_____	no trees	_____
any others (Name)	_____	others	_____
	_____		
	_____		
	_____		
	_____		
	_____		

ACTIVITY: Building materials survey

DISCIPLINE AREA: Social Studies

PURPOSE: To acquaint pupils with modern building materials.

OBJECTIVES:

1. The pupil will identify at least 75% of the building materials in and around school site.
2. Each student will be able to write a paragraph on how one material is made.
3. Each student will be able to explain how four out of five of the materials named are protected from weathering.

LEARNING ACTIVITY:

1. What building materials are used for:
    1. school building
        (a) inside?
        (b) outside?
    2. restroom floors?
    3. sidewalks?
    4. curbs?
    5. playground paving?
    6. street?
    7. utility poles?
    8. eavespouts?
    9. drain pipes?
2. Which of these building materials are made of:
    1. clay?
    2. cement?
    3. petroleum products?
    4. metal?
3. All building materials are subject to weathering. How are the following protected against weathering?
    1. bricks?
    2. ceramic tile?
    3. wood
        (a) buildings?
        (b) utility poles?
    4. cement blocks
    5. metal?
4. What is the difference between adobe and brick?
5. Why is adobe used only in the southwest?
6. Why are bricks or cement blocks used instead of wood in school construction?

ACTIVITY: Outdoor Hunt

DISCIPLINE AREA: Interdisciplinary

PURPOSE: To involve students in a group exercise that will increase their awareness to the school environment.

OBJECTIVE: Students will demonstrate their increased environmental awareness by scoring a minimum of 20 points on the Outdoor Hunt.

OUTDOOR HUNT

1.	Find and pick up two pieces of litter.	2 pts.
2.	Find two different trees.	2 pts.
3.	Identify the two trees you found.	1 pt. bonus
4.	Find two different shrubs.	2 pts.
5.	Identify the two shrubs you found.	1 pt. bonus
6.	Find signs of two animal homes on the school grounds.	2 pts.
7.	Find some animal tracks on the school grounds.	1 pt. bonus
8.	Find an outside trash can and put the litter you picked up in it.	2 pts.
9.	Find an outside bird feeder on the school grounds.	2 pts.
10.	If there is not a feeder on the school grounds, why don't you and your classmates build one later?	5 pts. bonus
11.	Think of two adjectives describing the weather.	2 pts.
12.	Think of two adjectives describing the grass.	2 pts.
13.	Think of two adjectives describing the trees.	2 pts.
14.	Write two different words describing TWO different sounds you heard while on the school grounds.	2 pts.
15.	Name two insects you saw on the school grounds.	2 pts.

(Each teacher should coordinate the rules for the hunt to fit his or her own school site.)

Community Resources

The community as a resource is a very valuable tool. The development of a directory of educational resources outside the classroom can be a worthwhile addition to any professional library.

The items in this section are samples of materials used by the ECO-Center to develop the Directory of Educational Resources for Carroll County.

Farm

Place:	Cliff Durward Farm
Address:	R. R. # 1, Thomson, Illinois 61285 (Argo Fay)
Contact:	Cliff or Norma Durward - Phone: 259-5720
Purpose:	To see first-hand care and activities of Dairy Farm
History:	Secured farm in 1955. Mainly dairy farm with Grade and Registered Holstein cattle. Tried Zero tillage of corn 1972.
Unique Feature:	47 cow comfort stall barn, 20 stall calf barn, (climate control.)
Field Trip or Classroom Experience:	Field Trip
Age or Grade Level:	Any
Number of Pupils:	Any
Available:	a. When? Above 20 degrees preferred b. To which schools? Any c. Day and hours? Any day 9:30 a.m. to 6:30 p.m. d. How much advance notice? 2 or 3 days
Time required:	30 minutes to 2 hours
Remarks:	Probably most interesting would be milking time or feeding of calves.

page 86 deleted; material is duplicated at the top of page 87.

UPPER MISSISSIPPI RIVER ECO-CENTER

R. # 1, Savanna, IL. 61074

Phone: 815-273-3595

Dennis Etnyre, Director

It has come to our attention through various members of your community that you have a special talent or business which you might share with the school children of our county. The Upper Mississippi River ECO-Center, along with the Educational Service Region, is developing a directory of educational resources available in Carroll County. These resources include both people and places which will benefit the students in our county: People willing to go to the classroom and share, Places where students may be taken for field trips.

As mentioned above, your name has been submitted as a possible resource. If you are willing to help, please fill out the enclosed form and return it to the ECO-Center. If you have any questions, please call Bruce Floyd at 273-3595.

Thank you!

Sincerely,

Bruce Floyd
ECO-Staff

Place:

Address:

Contact:

Purpose:

History:

Specifics (Example of Activities of the person, business, etc.)

Unique Feature:

Field Trip or Classroom Experience:

Age or Grade Level:

Number of Pupils:

Available:
a. When?
b. To Which Schools?
c. Day and Hours?
d. How much advance notice?

Time Required:

Remarks:

Working In The Field

This section will give you some ideas on how to plan and conduct a field trip. Examples of materials used by the ECO-Center are included.

PLANNING AND CONDUCTING FIELD TRIPS

PRE-TRIP PLANNING FOR THE TEACHER

Before taking any outdoor trip, it is a good idea to inform the parents about the trip your class is going to take. Along with the letter it is advisable to send a permission slip and a check list of items students will need for the trip. (See appendix for examples). Although these items take additional preparation time, they are important and will help to avoid misunderstandings.

The classroom teacher must always make the proper arrangements before departing on any trip. These arrangements usually include:

1. Obtaining permission from the school district.
2. Obtaining permission from the owner, manager, or director of the property to be visited is essential. Do this well in advance.
3. Making sure arrangements are made in securing transportation. This may involve transportation just to and from the site or it may be necessary for the bus to remain for the entire trip.

The value of field trips may be diminished somewhat if children are improperly dressed or if the children's behavior is disruptive to the goals of the field trip. It is important to discuss both these matters with the children prior to the field trip. When the children are involved in the decision making, it becomes a real learning situation.

(1) Field trips are very exciting to children. This excitement must be funneled into learning and not just excitement about being out of school. To take advantage of this excitement pre-planning is a must.

1. Pre-Planning
   - A. Decide where you are going and why.
   - B. What are you going to accomplish or solve?
   - C. Members of the class need responsibilities and involvement in the field trip.
   - D. Are you prepared with a knowledge of the materials to be covered on the field trip? This does not imply that you need all the answers, only that you have firmly in mind what the class hopes to accomplish on the field trip.

2. Planning for the Trip Itself
   - A. The length of a trip is important and might make the difference between a good field experience and a poor one.
   - B. Will the weather be a factor? If so, prepare for adequate clothing for children. Stress and restress; There is always someone that will want to go on a field trip ill-prepared for the prevailing weather.
   - C. How will the class conduct itself? Rules of conduct composed by you will probably work if you are tough enough but rules made by the children will provide a better learning situation and usually work just as well.

(1) by Don Jurgs, Director, Bettendorf Outdoor Education Program & Teacher Outdoors, Fall 1973

2. CONDUCTING THE TRIP (2)

Good leadership on the actual field experience is of critical importance. A few suggestions as to mechanics of directing and leading a group in the field will help make your trip a success:

1. Lead the group, pleasantly but firmly. A sense of positive leadership is the only thing that can focus the attention of each individual on the phenomenon to be studied.

2. Keep the group assembled unless there are special reasons for breaking it up. Don't let it just fall apart or spread out to the extent that communication becomes impossible.

3. Use a visual signal -- usually the right hand raised above the head -- to get attention. This is helpful because you may find more noise than you can cope with without shouting, if you attempt to use the customary vocal call. And shouting at pupils is as bad outside the classroom as inside.

4. When you reach a point at which an observation is to be made, lead about one-half the group past the point, form the entire line into a semi-circle, go back to the point yourself and proceed with instruction and observation. This little "trick of the trade" helps each member of the class to see, hear, and be heard. It avoids what is probably the most common fault of field teaching, that of teaching only the first few people in the line.

5. In many cases, especially in nature or conservation study outdoors, you will want to allow your pupils to "explore". Obviously, the highly organized scheme suggested above will not allow exploration. Your group will need to be broken into committees, or possibly even individuals. In that event, you will need to set definite spatial limits and arrange a signal, probably audible, for reassembly.

Field trips provide fine ways of teaching. But, you should be reminded, fields trips don't do your teaching for you. There is nothing magic or even automatic about them. You still must do the teaching! The trip provides fine materials; but only materials.

It is a good idea to begin any field experience with a review of its purposes. A re-statement of the standards of behavior is also helpful at this point.

(2) Taken in part from "How to Plan and Conduct Field Trips", Donaldson, George and Lou, Oregon, Illinois, Undated.

3. TEACHING IN THE FIELD[2]

A few general principles of teaching and learning have special application to the field trip technique. They are cited here as reminders:

1. Don't talk too much. The field trip is a time and place for experiencing. Too much lecturing is questionable even in the classroom; in field work it is unquestionably bad.

2. Use sensory experience. Children should see, feel, smell and taste -- as well as hear. All of these, judiciously employed, are possible and good. All have a contribution to make to total learning.

3. Emphasize a few basic concepts. One of your greatest temptations will be that of trying to teach too much. Too many concepts in a short time will serve only to confuse your pupils.

4. Stimulate your pupils' powers of observation. Good use of questions and good leadership of discussion will sharpen the learners' abilities to learn for themselves. What a child discovers for himself is always more meaningful to him than what is pointed out to him.

5. Draw out facts and generalizations from the learners. Use only as a last resort the device of telling pupils in words what their senses are already telling them. Remember, "Telling isn't teaching."

6. Lead your children toward the "how" and "why" as well as the "what" of the situation being experienced. Names of things are important and the "what" should not be ignored. But names alone shed little light. Relationships between things and the process which relate them are more important.

7. Although most of the generalizing and evaluating which you will want to do with your pupils is best done in the classroom after the field trip, you will likely find several points along the way at which you will want to draw together experiences to date or to pin down a particular bit of learning. You should not feel that all such activity must be left for the post-trip period. If you feel the need, do it!

[2]Taken in part from "How to Plan and Conduct Field Trips, Donaldson, George and Lou, Oregon, Illinois, Undated."

4. POST-FIELD TRIP ACTIVITIES

When a field trip is completed, its educational value is actually just started. Field trips should not be separated from the remainder of the education in the classroom.

1. The generalizations that have been studied on the trip need to be tied together so conclusions may be drawn and goals of learning reached.

2. Portions of a field trip may be used as a motivating factor for classroom assignments. An English assignment, for instance, is far more relevant if the children write about an experience they have just had on the field trip.

3. The field trip may lead to a new discussion or investigation.

Developing Your Own Program

It is imperative that you develop you own program; no one else can write a program that will fit your situation. Only you can analyze your teachers, your school's philosophy, and your educational resources in order to develop a program which is unique to your system. From the materials provided and the activities in which you have taken part, writing a simple outline for a basic environmental education program is quite easy. The program should be one which will make your students and citizens knowledgeable of environmental problems and develop skills to seek possible solutions. An environmental education program must consist of:

1. Classroom instruction
2. Using the school site
3. Using the community as a learning resource
4. Field experience
5. Cooperation with area agencies and orgainzations concerned with the environment

I. Start your writing with the question: "Where can we introduce environmental education in the classroom?" Write down your ideas.

II. "How can we use the school site to enhance our classroom work?", should be your next question. Write down your ideas.

III. "Are there people in our community or places in our community that can aid our work?" Write down your ideas.

IV. "Can we take a full day field trip which will tie all of the above items together?" Write down your ideas.

V. "What agencies or organizations will help us to do our job?" "How can they help us?"

Remember it is important that all activities relate to the ongoing curriculum. Pre and post all activities--don't take a field trip just for a trip. If it doesn't enhance what you are doing, then it is not worth having. It must be relevant to the ongoing curriculum, or it may be a waste of time.

Page 95 deleted, material duplicated on top of page 96.

Sample Schedule

A. Fifth grade activities - involving approximately 3 teachers and 70 students (tentative)

1. Spring - 1975
   Topic: Forest Study
   A full days experience at one site.
   Interdisciplinary environmental awareness.

2. Fall - 1976
   Topic: Field Study
   Soil and mapping - sites to be selected.

3. Winter - 1977
   Topic: Energy, food chains and webs

B. Sixth grade activities - involving approximately 3 teachers and 70 students (tentative)

1. Spring - 1976
   Topic: Cemetery study

2. Fall - 1977
   Topic: Interdisciplinary Ecology Concept
   Site: Mrs. F. Johnson's

3. Winter - 1977
   Topic: Man and Resources - Renewable and non-renewable
   Sites: to be chosen with assistance of diffuser

TENTATIVE SCHEDULE OF ACTIVITIES FOR 1975-76

I. Fifth Grade Activities - involving approximately 16 teachers and 375 students.

A. Field experiences for fifth grade students and teachers. Teachers will be responsible for pre-trip materials. A handbook is available for fifth grade teachers.

1. Sept. 3 - Sept. 24 Topic: Interdisciplinary Ecology Concepts

A full day's experience at one site emphasizing activities in various disciplines for environmental awareness.

2. Oct. 29 - Nov. 21 Topic: Man and the River
Site: Lock & Dam 13, Potters Marsh, Riverview, Spring Lake Wildlife Refuge

A mobile day's experience covering the different aspects of river development, use and man's influence both positive and negative.

3. May Topic: Man and the Elements
Site: Camp Benson, Mt. Carroll

Overnight experience or day camp activities at one site on geology, weathering, erosion, and use of the compass.

B. Inservice - Inservices will be offered for Galena and Scales Mound. New teachers are invited to attend from other districts.

II. Sixth Grade Activities - Involving approximately 14 teachers and 375 students.

A. Field Experience for Sixth Grade students and Teachers

1. Sept. 29 - Oct. 8 Topic: Land Use Study
Site: Timber Lake, Mt. Carroll & Oakville Historical Site

A day's experience for two classes (40-60) students involving stations on pine hardwood management, soil and water analysis, multiple use, and resort management.

2. February Topic: Winter Environment Study
Site: Local

One half to one day field trip at a local site.

B. Inservices offered for new teachers.

III. Fourth Grade Activities - Involving 16 teachers and 375 students

A. Field Experience

1. March — Topic: Community or School Site Study; Site: Walking Distance of School

2. April - May — Topic: Forest Study or Cemetary Study; Site: Local

One half day field trip to a local site on Environmental Awareness or Cemetary Study.

IV. First, Second, Third Grades - Involving 45 teachers and 1100 students.

A. Classroom visit - First, Second:

1. January - February — A classroom visit on an Awareness level.

B. Classroom visit - Third:

1. January - February — World Outside the Window or Career Interview.

V. Eighth Grade Activities - Involving 15 teachers and 375 students.

A. Field Experience for Eighth Grade Students and Science Teachers.

1. April — Topic: Group Science Activities; Site: Camp Benson

VI. High School Activities

A. Summer Courses for Academic Credit — 2 Courses

1. Canoe Camping Ecology Study — Site: Local

2. Second Course to be decided

Possibilities: Backpacking, Bicycling, Caving, Rock Climbing, Field Biology.

SUPPLEMENTAL

MATERIALS

Dear Parents:

You have read or heard of the Upper Mississippi River ECO-Center which has been established with Title III - ESEA funds and which has headquarters at Thomson. The purpose of the Center is to study the relationship of man and his environment. While eventually all school children will be involved in the program, this year's emphasis is being put on the fourth, fifth, and sixth grade.

Briefly what we are trying to do is to develop a knowledge of, love of, and appreciation for the out-of-doors, show how the environment affects man and how man affects the environment, and to make the pupils aware of what they can do in maintaining the delicate balance between man and his environment.

The idea is not to introduce a new subject into an already overcrowded school program, but to coordinate the study with their present subjects.

We hope your child finds this an enjoyable experience which he can share with you and the other members of the family and that you give him every encouragement possible.

During the year we will be taking one or more field trips. Each child must have a parent permission slip for each trip. This is important for no child may go on a trip without the parents' consent.

It is important that all children be properly and adequately dressed. This means slacks (no shorts) for the girls at all times, and protective shoes with socks. For winter field trips warm coats, caps, mittens, and boots are necessary. If the day is very cold heavy underwear (or two pair of slacks) and extra sweaters and scarfs are suggested.

At times the children will have to carry sack lunches. A place to keep them will be provided, but each lunch should be marked with the pupil's name. Water will be available; if your child desires anything else they should bring their own.

You understand, of course, that at all times the children will be supervised by the home room teacher and one or more members of the staff. A first aid kit is included with the equipment for each trip. Please inform the home room teachers of any special allergies or disabilities.

We sincerely hope this will be a most interesting and meaningful year.

The UMECO Staff.

Dennis Etnyre

Bruce Floyd

Helen Whitney

page 100 deleted, material duplicated on top of page 101.

Dear Parent:

Your child will soon be having his/her second field experience conducted by the ECO-Center. This will be an all-day trip, so a sack lunch will be necessary.

This trip includes a visit to Lock and Dam 13, Thomson Public Use Area, the housing development along the river north of Thomson, and the Wildlife Refuge.

As the children will be doing some hiking and will stand in exposed areas warm clothing is necessary. We also recommend boots so they can keep their feet dry.

Each child must have a consent slip. Will you please fill out the slip and return it to the room teacher before the trip?

The ECO-Center Staff

_____ may attend the ECO-Center field experience on _____.

Signed_____
(Parent or Guardian)

PERMISSION SLIP

My son/daughter _____ has
(Name)

my permission to go to _____
(destination)

on an educational field trip on _____
(date)

Signed _____
(Parent or Guardian)

PARENT CHECK LIST

A--DRESS

1. Long Sleeved Shirt
2. Old Pants or Slacks
3. Old Shoes or Boots (socks with both)
4. Warm Coat, if weather is BAD
5. Sack Lunch (?)
6. Inform teacher of special allergies or medication.

* BOOTS NECESSARY IN SNOWY AND WET WEATHER.

Have you signed the permission slip?

PLEASE RETURN TO THE TEACHER PROMPTLY.

CHECK LIST FOR TEACHERS

1. Permission from principal
2. Permission slips
3. Adequate and proper clothing
4. Arrange own transportation
5. Administration permission
6. Time of departure and return
7. List of pupils with special allergies or disabilities
8. Lunches if sack lunch is required
9. Prearranged signal for calling class together.

.....

Please fill out and hand to leader.

Date of trip _____

Time of departure _____

Time of Return _____

Name of pupil(s) with special allergies or medication:

_____

_____

_____

_____

Name of School _____

Name of Teacher _____

BUS TRIP ACTIVITIES

The following are sample activities that could be used on the bus trip to and from field trips.

Litter Count

Have children count roadside litter on their side of the bus. It might be advisable to divide each side into three groups, one group taking the near, one the middle, and one the far roadside. Add the count and see which side found the most. This exercise may be varied by counting one specific item of trash.

Billboard Count

Different sides could count the billboards on their side of the road. Includes all visible from road.

Signs of Autumn

This is an individual exercise. Could also be used for other seasons.

While Riding on the Bus

1. Name 5 types of trash you saw along the highway.
2. When given the signal start counting cars; put down the number of cars counted. Record the number of persons in each car.
3. As you travel along discover two things that pollute the air.
4. How many billboards did you see from Shannon to Mt. Carroll?
5. Do you think billboards are good or bad? Give reasons for your answers.
6. There is a junk yard located between Savanna and Thomson. What could be done to make this junk yard more attractive? What could be done to eliminate junk yards?
7. Out of Savanna we will cross Plum River. Why is the water so muddy?
8. How much do you think it cost to properly dispose of a beer can that somebody threw along the highway?
   What are some of the things that go into the cost?
9. The roads that you are traveling on need repair. Who pays for the upkeep?
10. What is the meaning of the word "ecology"?

Alphabet Game

Divide the class into two teams. Each team watches for nature objects beginning with consecutive letters of the alphabet, such as "apple tree, blue jay, creek..."Whichever team completes the alphabet wins.

I Went to the ECO-Center and I Saw

Start the game by saying, "I went to the ECO-Center and I saw a cricket." Each child in turn repeats the beginning of the sentence and adds on another thing seen, as "I went to the ECO-Center and I saw a cricket and a hawk." The list could be made alphabetical. This activity would be best for THE RETURN TRIP.

I Spied

Children may take turns describing something seen during their field trip. The child who guesses what is being described gets to describe the next object. This may be done in team form.

Watching for Points

In advance, make a list of nature objects which may be seen from the bus. Give each a point value. Divide the class into two teams (one on each side of the bus, or where two are sitting in a seat, they may compare). Points are given to the team sighting each object first.

In advance make up a list of various map symbols. Give each symbol a point value. As the bus passes landmarks which would be identified by symbols on the list, children check off the symbols. At the end of the trip the team (or individual) having the highest score wins. (Children should be prepared to tell where they saw a landmark if their scores are challenged.

Highway Bingo

Make up a bingo sheet of objects likely to be seen along the road. Winners could be either those completing a row first or black-out bingo by completing the entire card. Crayons could be used to mark the cards or a blunt piece of wood to punch out answers. This would eleminate sharp pencils.

Supplemental Curriculum Materials

The following list gives you names and addresses where you can obtain additional curriculum materials.

1. Project I-C-E
   1927 Main Street
   Green Bay, Wisconsin
   (A K-12 set of interdisciplinary curriculum guides)

2. Michael Teeley
   800 Highview Drive
   Antioch, Illinois
   (A series of curriculum aids based on 7 major themes of Environmental Education. The set is divided into four levels; K-2, 3-5, 6-8, and 9-12.)

3. Guide to Environmental Education, Conservation of Natural Resources K-6
   Department of Curriculum Development
   Madison Public Schools
   Madison, Wisconsin

4. Upper Mississispi River ECO-Center
   Savanna, Illinois 61074
   815-273-3595

   1. Environmental Education - An Interdisciplinary Approach for the Intermediate Level A 140 page Teacher's Guide to Fifth Grade Environmental Education. The guide contains field experiences, school site activities, and classroom lessons with behavioral objectives and evaluation method identified. The guide has many ideas for setting up a field program and coordinating it with the ongoing class work, appropriate for the intermediate level. Available at a cost of $2.50.

   2. Environmental Education Curriculum Guide for K-8
      An 84 page guide produced by a committee of elementary teachers. It is the purpose of the guide to coordinate environmental education in the elementary grades (K-8). The concepts are sequentially developed in six major areas: air, land, water, animal life, plants, and recreation; with suggested activities listed for teaching these concepts. Available for $1.00.

   3. Language in the Out-of-Doors - A list of 17 relatively simple language art activities to be coordinatied with outdoor experiences. Designed for minimum preparation and evaluation technique. Available for 50¢

4. Sixth Grade Land Use Study - A day's field experience for sixth grade students studying the land use of a private resort. Students are asked to identify uses of land, changes made, effect on wildlife and possible environmental problems. Study stations include pine hardwood forest management, mapping, soil testing, water testing, and multiple use identification. Available for 50¢.

5. Bibliography of Environmental Educatoon Materials - A listing of actual materials in the ECO-Center reference library. The listing contains may free materials and the better commercial materials currently being produced. Available at the cost of $1.00.

6. 101 Environmental Education Activities

Booklets:

Art and Music	12 Activities	.50
Language Arts	20 Activities	1.00
Mathematics	4 Activities	.50
Science	39 Activities	1.00
Science & Social Studies (Interdisciplinary)	14 Act.	.50
Social Studies	12 Activities	.50

OR $3.00 for entire set of booklets

Equipment

The following is a list of suggested environmental education equipment and materials to be used in the development of the program. Prices may have increased somewhat. They do not include postage and handling costs.

Standard 16 unit first aid kit
Handlens
Compasses
Clip boards
Water & soil thermometers
Hip boots
Water seine
Barometer
Insect net
Binoculers
Metric measuring tapes
G. I. Type shovel
Rock hammer
Soil auger
Safety goggles

Igloo water cooler
Plastic trash bags

Reference Materials

Examining Your Environment Series Pollution Running Water Snow and Ice Birds Mapping Small Places Mini-climates Small creatures	Winston Press/Mine Publ. Co. 25 Groveland Terrace Minneapolis, Minn. 55403 $3.00 per book
People & Their Environment Grades 1-2-3 Grades 4-5-6 Grades 7-8-9 Grades 10-11-12 Social Studies Biology Science Outdoor Lab. 1-12	J. G. Fergusen Publishing Co. 6 N. Michigan Ave. Chicago, Illinois 60602 $3.40 per book

Outdoor Education Equipment (Bachert/Snooks) $8.00	The Interstate Printers & Publ. Inc. Danville, Illinois 61832
Tips & Tricks $4.20	" "
Teaching in the Field 50¢	The Donaldsons Box 203 Oregon, Illinois 61061
Foxfire $5.00	Foxfire Rabun Gap, Georgia 30568
Environmental Education Activities Manual $8.50 - 6 books	William B. Stapp and Dorothy A. Cox 3808 La Mar Farmington Hills, Michigan 48024
Master Tree Finder Winter Tree Finder Flower Finder 75¢ each	Nature Study Guide Box 972 Berkeley, California 94701
Teaching Science with Garbage Teaching Science with Soil Recycling $1.50 each	Rodale Press Educational Service Division Emmaus, Pa. 18049
Transparency Duplicating Books Crossroads: Water Birds Ecology Weather Science Seasons & Living Things Planet at a Crossroad Prehistoric Life Mammals Rocks & Minerals $6.95 each	Milliken Publishing Co. 611 Olive Street St. Louis, Missouri 63101
McDonald's Ecology Action Pack (free)	McDonald's Action Pack Box 2344 Kettering, Ohio 45429
Ecosystems $3.75	National Audubon Society Educational Services 950 Third Street New York, N.Y. 10022
Golden Guide: Ecology	Environmental & Outdoor Education Materials Co. Box 585 Lander, Wyoming 82520

Ryerson Science in Action:
Studying Birds $2.50
Insects 2.60
Soil 2.60
Stream 3.00
Mammals 3.00
Studies for the Woodlands $2.12

McGraw Hill Co. of Canada
330 Progress Ave.
Scarborough, Ontario

79025TB Difference in Living Things (4-8)
79061TB Man's Habitat, the City (4-9)
79070TB Fish & Water Temperature (4-9)
79095TB Nature Hunt (K-1, Spec. Ed.)
79089TB Oaks, Acorns, Climate, & Squirrels (1-6)
79034TB Shadows (1-8)
79016TB Vacant Lot Studies (5-9)
79043TB Wind (3-6)
79052 Snow & Ice (1-6)

$1.00 - 1.50

National Wildlife Fed.
1412 - 16th St., N.W.
Washington, D.C. 20036

Investigations in Ecology

Chas. E. Merrill Publishing Co.
1300 Alum Creek Drive
Columbus, Ohio 43216 $9.95

Yellow Pages of Learning

Massachusetts Technical Press
50 Ames St.
Rm. 714 Bldg. 19
Cambridge, Mass. 02142

Audubon Aids:

AP 1 Ecology Study Program
2 Bird Study Program
3 Tree Study Program $12.00
4 Plant Study Program per
5 Mammal Study Program set
NB 2 Good Teaching Aids
3 Animals & How They Live
4 Insects
5 Plant Identification $16.00
6 Conservation per
7 Ecology set
8 Flannel Boards

National Audubon Society
Educational Services
950 Third Street
New York, N.Y. 10022

Ten Minute Field Trips $5.00

J. G. Ferguson Publishing Co.
6 N. Michigan Ave.
Chicago, Illinois 60602

Environmental Education & your School Site
$3.00

Open Lands Project
53 W. Jackson Blvd.
Chicago, Illinois 60604

Using the School & Community
$1.50

Nashville - Metro School
"Lib" Roller
Outdoor Education Director
Nashville, Tenn. 37202

Upper Mississippi Environmental Awareness Test

This is the same instrument given to all fifth grade students who take part in the ECO-Center program. It is a pre-post instrument. See how well you do without any instruction in environmental education and then take the test again in the spring after the training session and outdoor experiences of your students. The taking of the test will help you identify some of the concepts which are so important to teaching the goal of developing students who are environmentally literate.

UPPER MISSISSIPPI ENVIRONMENTAL AWARENESS TEST

DO NOT WRITE ON THE TEST
Place all answers on the answer sheet.
Mark 'A' on your answer sheet if you think the statement is true.
Mark 'B' if you think the statement is false.

1. Natural resources are resources that man has made such as cars or plastics.
2. Non-renewable resources can be used again and again.
3. Man can change his environment very much.
4. Only green plants are able to capture the sun's energy and produce food.
5. Man always makes his environment better when he changes it.
6. We are using natural resources so fast that people in the future may not have enough.
7. The best way to preserve wildlife is to put it in zoos.
8. Natural areas, if left alone, stay the same.
9. Erosion is a natural process which man can do nothing about.
10. We are using our resources faster because we want more things and we want more trade.

For questions 11-20 mark on your answer sheet the letter above the word that means almost the same as the word in the left column.

	A	B	C	D
11. Conservation	using	preserving	wasting	watering
12. cycle	circle	square	circus	pamphlet
13. precipitation	rainfall	springs	rivers	mineral resources
14. returnable	throwaway	reusable	partway	turntable
15. recreation	work	play	road building	school
16. erosion	building up	precipitation	wearing down	spraying
17. evolving	turning wheels	falling leaves	slowly changing	running water
18. atmosphere	temperature	ground water	air	soil
19. soil	stream	solid	cliff	earth
20. pollution	waste	vacuum	atmosphere	running water

Multiple Choice

For Items 21-30 mark on your answer sheet the letter of the words which make the sentence true.

21. A producer is

    a. an animal that eats plants (plant eater).

    b. an animal that eats other animals (meat eater).

    c. a fungus that eats off decaying material.

    d. a green plant that makes food.

22. Using the same forest area for lumber, camping, hunting, and hiking is an example of

    a. multiple use.

    b. zoning.

    c. succession.

    d. farming.

23. Taking care of natural resources to prevent destruction or neglect is called

    a. biology.

    b. conservation.

    c. multiple use.

    d. zoning.

24. Which terms best describe the water cycle?

    a. precipitation, run off, evaporation

    b. run off and erosion

    c. rain and cloud formation

25. The atmosphere affects

    a. only people working out-of-doors.

    b. only people working at night.

    c. everyone.

    d. only people in cold climates.

(Multiple Choice-Cont'd)

26. Your environment is

    a. living things in your community.

    b. non-living things in your community.

    c. everything that is around you.

    d. the sun and its planets.

27. Ecology is the study of the relationships between

    a. living things and environment.

    b. man and weather.

    c. plants and animals.

    d. birds and bees.

28. Conservation is the responsibility of

    a. industry.

    b. farmers.

    c. teachers.

    d. everyone.

29. When a log rots its material is

    a. lost forever.

    b. returned to the soil to be recycled.

    c. turned into a fossil.

    d. evaporated.

30. Which of the following is the original source of energy on our earth?

    a. sun

    b. moon

    c. animals

    d. atomic generators

MATCHING

For questions 31-35 indicate the letter of the word or phrase on the right that matches the word on the left.

31.	fossil	a.	natural power
32.	extinct	b.	plants and animals must have each other
33.	energy	c.	rock-like remains of a plant or animal of the past
34.	consuming	d.	no longer alive
35.	interdependence	e.	using

MATCHING

For questions 36-40 indicate the letter of the word or phrase on the right that matches the word on the left.

36.	organism	a.	materials obtained from the ground
37.	minerals	b.	can be used again
38.	decay	c.	living plant or animal
39.	recyclable	d.	the world around us
40.	environment	e.	the breaking down of something

For questions 41-55 three answers are correct. Mark on your answer sheet the letter of the answer that is <u>not</u> correct.

41. Pollution may result from

a. frost killing plants.

b. not enough sewers.

c. people not trying hard enough to prevent it.

d. too much waste.

42. Soil should be

a. kept fertile.

b. abandoned when it won't produce.

c. built up.

d. conserved.

43. Living plants furnish material for

a. food.

b. clothing.

c. metals.

d. shelter.

44. People living any place

a. have no effect on the area.

b. always change it.

c. may change it greatly.

d. may change it very little.

45. Wildlife populations can be kept by

a. hunting when one wants to.

b. planning areas where animals can live naturally.

c. letting them increase naturally.

d. staying out of their natural areas.

Mark on your answer sheet the letter of the answer that is <u>not</u> correct.

46. People can preserve natural resources by
    a. using them as they want to.
    b. careful planning for the future.
    c. substituting something for the future.
    d. reusing natural resources as much as possible.

47. Natural resources like coal and oil
    a. are found only in certain places.
    b. are not found equally in all countries.
    c. may be sold or traded from one country to another.
    d. are divided equally among all countries.

48. When we learn more about our environment we
    a. can improve it.
    b. control things that harm it.
    c. try to make it better.
    d. do as we please.

49. Water
    a. may be used again if cleaned.
    b. is easily contaminated or polluted.
    c. may be used only once.
    d. is important to all forms of life.

50. The number of people who can live in an area depends on
    a. water.
    b. food.
    c. usable space.
    d. wind.

Mark on your answer sheet the letter of the answer that is <u>not</u> correct.

51. Water pollution comes from

    a. industries.

    b. cities.

    c. farms.

    d. marshlands.

52. People can help the environment by

    a. putting all the blame for pollution on the factories.

    b. using soil conservation practices on their farms.

    c. picking up litter.

    d. doing less burning.

53. The river is valuable to man because it can be used for

    a. transportation of goods.

    b. recreation.

    c. dumping sewage.

    d. commercial fishing.

54. A wildlife refuge closed area is a

    a. place for hunters to shoot ducks.

    b. sanctuary.

    c. place to manage wildlife.

    d. place to save endangered species.

55. Sewage plants

    a. keep harmful wastes out of our rivers.

    b. remove most pollutants from water.

    c. provide drinking water for most cities.

    d. safely remove wastes from our cities.

Upper Mississippi Environmental Awareness Test

Key

A - True B - False

1. B
2. B
3. A
4. A
5. B
6. A
7. B
8. B
9. B
10. A

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11. B
12. A
13. A
14. B
15. B
16. C
17. C
18. C
19. D
20. A
21. D
22. A
23. B
24. A
25. C
26. C
27. A
28. D
29. B
30. A
31. C
32. D
33. A
34. E
35. B
36. C
37. A
38. E
39. D
40. D
41. A
42. B
43. C
44. A
45. A
46. A
47. D
48. D
49. C
50. D
51. D
52. A
53. C
54. A
55. C